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WE understand that the complete report of Mr. S. F. EMMONS on the Leadville District has at last been published by the United States Geological Survey. It comprises a volume of text and an atlas, both of which can be obtained by writing to the Director of the Geological Survey at Washington, and inclosing the price of the books, which is $8.40. We have not yet seen the publication in question, but we judge from this price that it must be a very elaborate and handsome one. The prices charged by the United States Geological Survey for its publications have hitherto been much below their value, as fixed by the ordinary current rates for similar books in the general trade. We shall notice this report hereafter.

THE daily papers have excelled themselves this week, in the publication of a telegram from Ottawa, Canada, announcing the discovery of a gold-bearing quartz vein in that province, which shows by assay $800 per ton, *and promises to improve in depth!* Our disinterested advice to the owners would be, to pray earnestly that such a vein as that might not "improve," but simply stay just so!

But this $800 assay reminds us of an anecdote related of an engineer of the last generation, who was great on theoretical calculations, and put perfect trust in his figures and diagrams. On one occasion, he built a truss bridge, which, as soon as the temporary supporting structure had been removed, incontinently tumbled down of its own weight. Surveying for a moment the unexpected ruin, he rushed into his office, and began to study fiercely his strain sheets and formulas, from which he soon started up with the comprehensive exclamation, "That cursed decimal point!"

We suspect there is a missing decimal point somewhere in the Province of Ontario, and possibly, if caught and placed where it belongs, it would make $8.00 out of the $800 found in the new discovery. *

THE SOURCES, PRODUCTION, APPLICATIONS, AND VALUES OF THE RARER METALS.—I.

Although it has been satisfactorily demonstrated by scientific research that of the total number of known elements or simple bodies, some fifty at least are metallic, the general attention of the industrial world has hitherto been concentrated, outside the laboratory, upon those metals that have proved to be readily adaptable to practical purposes, and we have been satisfied to leave the others with no further acquaintance than is entailed by a mere knowledge of their names. Thus, few people ignore the history and qualities of calcium, sodium, potassium, magnesium, manganese, aluminium, iron, gold, silver, copper, lead, zinc, tin, antimony, mercury, bismuth, nickel, cadmium, cobalt, platinum, and palladium, for the simple reason that we are all more or less directly interested in the arts, in manufactures, and in commerce, and because every one knows that in addition to their other attributes, the first seven in the list are indispensable factors in the construction, nutrition and preservation of animal and vegetable life! But how many are there who could write the history of barium, cerium, cœsium, chromium, didymium, Baryum, gallium, glucinum, indium, lanthanium, molybdenum, niobium, osmium, rhodium, ruthenium, rubidium, strontium, selenium, tellurium, thorinum, tantalum, tungsten, titanium, thallium, uranium, vanadium, yttrium and zirconium, or have more than the faintest notion of their origin and value, or how they are obtained, and for what purposes they may be employed? In the necessarily narrow space at our command it is impossible to compass all that relates to the elementary chemistry of these rare bodies, but the rapidity of our progress in all departments of scientific research, and the recent discoveries which have secured to us cheap sodium, potassium, aluminium, magnesium, and various other metals hitherto without the pale of industrial consumption because of their high price, impel us to give them some small share of the attention they undoubtedly deserve, and which they will ultimately, and probably ere long, imperatively demand. A metal has been defined as an element capable of forming a base by union with oxygen; as having but little disposition to combine with hydrogen, and as evincing so powerful an attraction for chlorine as to form with it compounds which dissolve in water without appearing to undergo decomposition. The whole of the metals have been divided, in accordance with their various aptitudes for chemical combination, into a number of groups, and it will be our endeavor in these brief comments to keep this fact prominently before us, and to deal with them in the order of their actual classification.

To begin with the

CALCIUM GROUP,

we find its titular member, in its various combinations, more generally employed in the arts and manufactures than any other metal, being, as it is, the base of the lime carbonate (limestone and chalk), sulphate (gypsum), fluoride (fluorspar), and phosphate (apatite), which constitute so large a portion of the earth's crust. It is of a bright, but pale yellow color, and easily malleable, being softer than zinc, but harder than lead or tin. At the ordinary temperature it rapidly decomposes water, and when heated in the open air burns with a flame which, while only of short duration, owing to the formation of oxide, is dazzling in its intensity. It combines with molten sulphur and the vapors of phosphorus to form sulphide and phosphide of calcium, and when treated with diluted hydrochloric or nitric acids, at once dissolves.

If we refer to the elementary composition of pure limestone as a single example of the manner in which this group of metals is associated in nature with other bodies, we shall find our explanation in its chemical formula $CaCO_3$, by which it is shown to contain in every molecule: Calcium (Ca) 1 atom, weighing 40 parts, carbon (C) 1 atom weighing 12 parts; oxygen (O) 3 atoms weighing 48 parts. When this compound body is burnt in a kiln, with a proper draught, all the carbon, and two parts of the oxygen are driven off into the air in the form of carbon dioxide, leaving behind what is generally called quick or burnt lime, composed of one atom each of calcium and oxygen, as expressed by the formula CaO, and containing in every 100 pounds: Calcium (Ca), 71·43 pounds; oxygen (O), 28·57 pounds.

Considering for a moment the very low price at which a ton of this burnt lime may be procured in the markets, it will at once strike us that, with every ton purchased at, say, 10 dollars, we, to all intents and purposes, acquire rather more than 1400 pounds of metallic calcium! It, therefore, sounds very much more like a satire, an absurdity, and a contradiction than a sober fact to affirm that this widely disseminated element is in reality a *rara avis in terris;* that it is sold by the ounce at the fabulous rate of $2400 per pound; and that if, even at this figure, an order for only 100 pounds for

immediate delivery were to be flashed by cable to the chief centers of the world, it could not by any possibility be filled! This startling, yet unelaborated, truth can only be explained by the singularity of its properties, and the enormous difficulties that continue to attend the manner of its preparation. It was first eliminated by Sir Humphrey Davy in 1808 by means of the galvanic battery, but it is now generally obtained by the following complicated process: 8 parts of calcined gypsum and 3 parts of finely-ground charcoal are well mixed and burnt in a crucible at a white heat for the space of an hour. The resulting sulphide is treated with water, to which is gradually added, with frequent stirring, small quantities of iodine, until the liquid evolves a great deal of heat, and no longer changes color. A little slaked lime is then thrown in, and the entire mixture left standing for several hours, in order that any aluminic, silicic, ferric or manganic oxides may be precipitated; after which it is filtered, the liquid evaporated to perfect dryness, and left on the fire until vapors of iodine commence to be given off. The residue is introduced into a porcelain crucible, inclosed in an earthenware pot, and, all spaces between the two vessels being filled up with powdered charcoal, heat is again applied for half an hour. It is then allowed to cool, and the substance, having been detached, is placed with a sufficient proportion of pure metallic sodium, in an iron crucible provided with a screw top. The whole mass is then submitted to great heat and considerable pressure, and during the fusion thus induced, the iodine passes over to the sodium and leaves the calcium free.

The only other members of this remarkable group, are the pole yellow metals, Barium and strontium, both of which very much resemble calcium in all that is yet known of their chemical or physical properties. The principal sources of barium are *witherite*, or carbonate of barytes, and *heavy spar*, or sulphate of barytes, while strontium is derived from its carbonate, or *strontianite*, and from its sulphate, *celestine*. Each is obtained in a pure state by dissolving its carbonate in very dilute hydrochloric acid, evaporating the solution, fusing the chloride thus produced at an intense white heat, and then causing its decomposition by a current of electricity. Like calcium, both metals very readily oxidize in the air, and decompose water at the ordinary temperature in order to seize upon its oxygen; but strontium is distinguished from the rest by burning with a beautiful crimson flame.

The various compounds of which they are the bases are very extensively employed in the arts, especially in the manufacture of paints and fireworks; but, for similar reasons to those given in the case of calcium, neither of them has yet received, as a metal, any thing more than the cursory attention usually accorded to the curiosities of science. Hence, while the carbonate of barytes contains 69·58 per cent of pure barium, and the carbonate of strontian 59·37 per cent of pure strontium, and while either of them may be bought for a few dollars per ton, the actual market price of Barium is $975 per pound, and that of strontium $128 per ounce! We might well point to the history which repeats itself and say, that when some new inventive genius shall have sprung up in our midst, and studied out (or stumbled upon) a hitherto undreamt of channel in which these metals may be profitably utilized, we shall doubtless find means of producing them as cheaply as we now produce magnesium. Meanwhile, and pending this revelation, we must be content to leave them in the undisturbed enjoyment of their obscurity, and seek more remunerative subjects in the fields of usefulness.

THE USE OF ELECTRIC MOTORS IN MINES AND MILLS.

The distribution of power by electricity was long looked upon as a visionary and impracticable scheme, but it has now become one of the accomplished facts of our progressive age, and is, undoubtedly, destined by its immediate future development to create a gigantic revolution in prevailing customs, earning for itself an all-important position in the world's affairs from an industrial point of view.

The highly interesting articles by Professor Forbes, which appeared in our columns, October 1st and 8th, upon the subject of electrical lighting from central stations, sufficiently exhausts the general aspects of our present subject to make any explanation of the theories of the distribution of power or of the operation of a motor unnecessary.

Electricity may be regarded as simply an agent of transmission—a convenient, tractable, yet powerful means of carrying and distributing energy from one point to others. As a means of transmission it is far more flexible in its arrangements, and capable of a more ready ramification and distribution than any of its competitors. It can be operated under very much higher pressures than either gas, water or steam, and can be distributed with very much smaller conductors and, consequently, at a much lower cost.

The utilization of the wasted power of the winds and of the waterfalls has long been the aim of engineers, and much progress has of late years been made in attaining this end. Every one is familiar with the general utilization of this variable and uncertain power in pumping up into the rivers the water from the great areas of dry land which lie below the level of the sea in Holland. The ability to store the water in the canals and drains there makes it possible to use an intermittent power. The converse of this problem is now being worked out satisfactorily in accumulating this variable energy of the wind in the form of electricity in storage batteries, from which it can be drawn off as desired to perform intermittent work. This is now being done in many cases where the electricity is required for electric lighting, and it is also coming into use or driving tram cars and locomotives and in some other uses.

It needs no elaborate argument to show the readers of The Engineering and Mining Journal that the utilization of the power of the wind and of the waterfalls would prove an immense benefit in many mining districts where transportation is high and fuel expensive, while waterfalls and the wind are available, or where steam power can be obtained more cheaply at some other point than that at which the power has to be utilized.

The question of the loss of energy in transmission between the prime motor and the work to be done, except in those rare cases of a superabundant power of some waterfall is a most important one; in fact, the practical questions of importance are the cost of the installation per horse-power utilized; the cost of running expenses, and the percentage of applied power that is available for use.

The generation of power in ordinary cases is either by the force of the wind, by utilizing a waterfall, or by steam. The utilization of the force of the wind by means of wind mills is, no doubt, the cheapest source of power, because in general it can be obtained near the point at which it has to be applied, but the intermittent character and variable force of the wind renders it unsuitable for many purposes, unless the energy when over-abundant can be stored up, and be drawn upon to supplement an insufficient supply at another time. This is, to a less extent, true also of water-power, which has the further disadvantage of frequently being situated in very inconvenient positions, necessitating some means of transmission of the power from the water-wheel to the point where the work has to be done. The means of transmission in these cases, as well as in that of a steam engine which has to be placed at a distance from the work to be done, are by belts and shafting, by wire rope transmission, by means of compressed air, by water pressure and, lastly, by means of electricity.

The loss in transmitting power by belts and shafting is very variable, and in a single mill frequently amounts to 25 or 30 per cent of the whole power used. Wire rope transmission involves also the use of shafting, and, though specially adapted to transmission of power over considerable distances, appears to have some advantages over belts. Several New England mills now use a large number of small ropes running on a groved pulley, and leading the power direct to different parts of the mill, thus avoiding the use of much countershafting.

Compressed air has many advantages in underground work; it is the only means thus far used to any extent in driving power rock drills, and after performing this work it aids the ventilation and reduces the temperature of the mine. It can be used to transmit energy over great distances, as in the cases of all long modern tunnels, and as at the Chapin mine, Michigan, where it carries the power from the Quinnesec Falls, on the Menominee River, three miles to the mines, to be used in driving hoisting-engines, pumps, and rock-drills. The proportion of the power applied to the air compressors that is actually utilized at the mine is stated to be about 30 per cent, or the loss is about 70 per cent. The plant has been very expensive; it is said to stand the company in about $400,000, for an effective energy of perhaps 500 horse-power. And the same boiler plant is maintained at the mines as if they were dependent solely upon steam for power.

Hydraulic pressure carried through pipes is used successfully and economically in some cases for driving machinery where the conditions are favorable, but it is evident that its use is much more restricted than that of compressed air.

Electricity as a means of transmission possesses, as we have said, many advantages over either of the other agents mentioned. It can transmit power for almost any distance and deliver it directly where the work has to be done and with a loss which manufacturers of electric plant are ready to guarantee will not exceed, according to distance and other conditions, 30 to 50 per cent of the power used in generating the electricity. Steam, water, or wind power may be used to drive the dynamos, and it is claimed by the Sprague Electric Company that the loss of power in converting the energy at the dynamo does not exceed 10 per cent., that the loss by transmission for one mile is within 10 per cent, and the loss by reconversion at the motor is, say, 10 per cent. If the motor be applied directly to the machine doing the desired work, the loss of power, as well as the expense in shafting and belting, is avoided, while the cost of the conducting wire is a mere trifle, as compared with that of pipes for carrying compressed air or water. The dynamo takes the place of the air compressor at much less cost, the conducting wire that of the air pipe, and the electric motor that of the compressed-air engine. Without at present entering into the detailed figures of cost of each, which information may

be obtained from any of the responsible electric motor manufacturers for any specified case, it is evident that the electric transmission of power possesses many features of economy which are peculiarly its own, and that it can be applied with great advantage in many cases where any other means of transmitting power is impracticable.

The utilization of wind-mill motors and the storage of energy in storage batteries, from which it can be drawn for the electric lighting of mills, the working of locomotives, the driving of mill and mine machinery, is destined to receive many applications, especially in our western mining districts, in Mexico, and in other countries where fuel is expensive and water-power absent.

The cost of Julien storage batteries is given in the company's price-lists as $13 per cell, and three cells (746 watts) will give one horse-power per hour, allowing 20 per cent of reserve in the battery. A three horse-power dynamo would charge 60 cells of battery in 10 hours.

A street railway outfit where the cars have a 12 horse-power capacity capable of a maximum speed of 12 or 15 miles an hour on a level would be operated from 240 Julien cells, costing about $3000, one half of the cells being duplicates.

One dynamo of 50,000 watts capacity is said to be capable of supplying 10 such street car motors, and would cost $2500—but smaller dynamos suitable for any special use can be obtained at corresponding figures. One price-list before us gives the investment in an Eastern city for a 100 horse-power station as $5000 for steam plant; belts and incidentals, $500; electric plant, including dynamos, etc., $8,500; total, $14,000; and for a 50 horse-power station, $8000.

We shall be pleased to answer any questions our readers may ask concerning the applications of electric motors for use at the mines and mills, and estimates can be procured from the Sawyer-Man Electric Company for electric lighting, and from the Sprague Electric Railway and Motor Company, the Daft Electric Light Company, the Julien Electric Company, and others.

Among the inquiries we have recently received concerning the applications of electricity at the mines was one asking whether the energy of a neighboring waterfall could be converted into heat for the purpose of roasting ores in a district where fuel is expensive. Thus far we have no satisfactory answer to this question; but it is certain that such an immense economy can be effected at many mines by the use of electricity in other ways that it will enable many now unprofitable mines to be brought into a dividend-paying condition.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

Separation of Metals from Platinum Ores.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: While I have no desire to adversely criticise the able article upon this subject contributed to your columns on the 8th inst. by Dr. Pirugruber, I can not help thinking that his processes are much too complicated to be economical, and that they have consequently little value outside the experimental laboratory. What we require, industrially speaking, and what every one is striving to attain, are cheap and rapid, as well as effectual methods, and in these respects I fail to perceive any new advantages offered by our author. In actual metallurgical practice, the *modus operandi* most approved by our best technical and manufacturing authorities may be roughly outlined as follows, no notice, of course, being taken of any details relating to the ultimate purification of each element.

The Ore is Boiled with Aqua Regia.

Pt. Pd. Ro, go into solution.
To this is added NH_4Cl

PLATINUM

is precipitated as $2NH_4ClPtCl_4$
The filtrate is neutralized with Na_2CO_3 and treated with $Hg(CN)_2$.

PALLADIUM

is precipitated as $PdCy_2$.
The filtrate is evaporated with HCl and treated with C_2H_6O.

RHODIUM

is precipitated as $3NaClRoCl_3$.

Ir. Os. Ru. Titanic iron, chrome iron, etc., remain undissolved.
This residue is heated in a current of air.

OSMIUM

is thus volatilized as OsO_4

RUTHENIUM

is carried forward mechanically by the air current and deposited at the heated extremity of the tube as RuO_2.

The residue is mixed with NaCl heated in a current of Cl and treated with boiling H_2O.

IRIDIUM

goes into solution as $2NaClIrCl_4$.

These remarkable metals form a group which has been arranged by Bloxam in two divisions according to their different atomic weights and specific gravities, thus:

	Atomic weight.	Sp. gr.		Atomic weight.	Sp. gr.
Platinum	197·1	21·5	Palladium	106·5	11·0
Osmium	199·0	22·4	Rhodium	104·3	11·4
ridium	197·1	22·4	Ruthenium	104·2	11·4

and, by the facility with which it oxidizes and becomes volatile, osmium establishes a connection between this group and phosphorus, arsenic, and antimony, as does palladium by its easy solubility in nitric acid and its special affinity for cyanogen and iodine, with mercury and silver. I regret that Dr. Pirugruber should have omitted all mention of the metal Davyum, so distinguished from all those others of platinum by the insolubility of its double chloride in water or alcohol; but I presume that its present seeming lack of utility is the reason for his neglect.

Yours respectfully, FRANCIS WYATT.

The Russian Copper Production.

EDITOR OF THE ENGINEERING AND MINING JOURNAL:

SIR: Will you kindly allow space for a notice in reference to your article of 3d September on "Condition of Some of the Large Copper Companies" with regard to the Russian mines? The *Revista Tecnologico Industrial* has made a great mistake, which, unfortunately, went through nearly all scientific papers, in saying that "out of 1758 copper mines in the Ufa government only 28 are in operation."

In the whole Russian Empire there have never been in operation 1758 copper mines, and in the Ufa government there are only five mines in operation, which figure under Nos. 5, 6, 7, 8, and 9, as below. The only reliable information on copper-mines in operation in Russia is shown in the following two official tables for the year 1885:

1885. Copper mines belonging to	In	Government.	Name of mine.	Copper in bricks.' Poods.*	
The Emperor	Siberia.	Tomsk.	1 Suzunsk.	24,605—	24,605
The State	The Ural.	Perm.	2. Yugovsk.	5,997	
N. M. Polovtzoff	"	"	3. Bogoslovsk.	65,640	117,324
Demidoff San Donato	"	"	4. Wiisk.	45,705	
W. A. Pasrhkoff	"	Ufa.	5. Bogojavlensk.	3,677	
"	"	"	6 Werkhotorsk.	7,816	
E. A. Dasrhkoff	"	"	7. Blagoveshcorsk	2,728	29,359
Count Kossakovskoi	"	"	8. Arkangelsk.	1,816	
English Company	"	"	9. Woskresensk.	13,322	
Rezanoff	Kirgiz-Steps	Akmolinsk.	10 Spasskü.	23,933—	23,933
Turkish Company	Caucasus	Tiflis.	11. Alvertski.	3,093	3,271
"	"	"	12. Shamblugsk.	178	
Siemens Brothers	"	Elixavetopol	13. Kedabekskii.	45,031	
"	"	"	14. Kalakentskii.	28,786	
Kunduroff Company	"	"	15. Ug Tshaiskii.	1,752	
Greek Company	"	"	16 Galizurskii.	1,800	78,348
Lazareff Brothers	"	"	17. Lazarcffskii.	574	
Mutafow & Co.	"	"	18. Katarskii.	405	
E. Meyer & Co	Finland.	Wiborg.	19. Pitkäranta.	11,500—	11,400
				288,258	288,258

* 1 pood = 36,113 English pounds. 288,258 poods = 4 650 English tons

Already in the middle of the seventeenth century, copper was extracted in the Altaï Mountains (A. T. Keppen). Up to 1845 Russia produced annually from 200,000 to 250,000 poods of copper. During the following 7 years the production increased remarkably and attained 410,000 poods.

At that time large quantities went abroad, and Russian copper occupied on the European markets an important position.

In 1852 the production commenced going down by degrees, and in 1879 the general production of copper was only 19,687 poods, say less than half the quantity of 1852.

The principal reason for the decrease of the production was the considerable export of copper from Chili, Australia, and the United States of America since 1867.

When the whole of Europe produced 1 million poods, Chili alone brought into the market 2,500,000 poods.

Consequently, prices went down in Europe, and Russia produced so much the less, for our ore is of low grade.

Foreign copper has been imported into Russia in large quantities, principally since 1867.

The domestic production during the last 10 years in Russia has been as follows:

From.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.
Ural, poods	114,193	82,855	108,442	78,496	101,832	126,083	128,934	165,762	221,935	146,701
Caucasus	58,328	69,825	43,757	49,257	35,800	37,551	48,538	54,552	87,544	81,619
Kirgez Steps	28,865	31,244	31,162	31,175	28,234	18,578	19,100	22,214	34,500	23,933
Siberia	33,615	28,700	28,712	28,690	28,678	21,500	16,800	14,015	24,000	24,605
Finland	1,287	1,005	2,792	2,305	1,172	7,262	5,908	9,396	11,658	11,405
South	135	200								
Siberia, private				764		491				
Total, poods	236,453	213,929	214,865	190,687	195,516	211,465	219,280	265,939	379,687	288,258
" tons										

Since March 19, 1886, the import duty having been raised to 2·50 roubles in gold per pood, no foreign copper has come to Russia, and there is no doubt that our copper production will considerably increase, especially in the Kirgiz Steps, in the Caucasus, as well as in the Olonetz government, near the Lake of Ladoga. W. A. A.

ST. PETERSBURG, September 12|24, 1887.

The Water Capacity of Soils.—According to the *Journal of the Society of Chemical Industry*, Herr E. Wollny has been making a long series of very exhaustive experiments, which have led him to form the following conclusions: I. The water capacity (measured by volumes) of a soil diminishes with a rise in temperature. The opposite is the case with peat. This diminution is relatively greater the larger the pores in the soil. II. (*a*) The freezing of the water in soils usually causes a diminution in their water capacity. (*b*) This latter result is merely transient in the case of soils of only a slight cohesive character—*i. e.*, coarsely granular, sandy, poor in vegetable matter. It is of a more permanent nature in the case of soils which show a tendency to form crumbs—*e. g.*, finely granular, argillaceous soils, or soils rich in vegetable matter. (*c*) The result mentioned in (*a*) is more marked the greater the quantity of water in the soil, and the more frequently (within certain limits) the frosts alternate with thaws. (*d*) In the case of crumby soils the duration of the diminished water-holding capacity may be materially altered, and even converted into an increased capacity if there are frequent alternations of frost and thaw or the crumbs are loosely aggregated, as this facilitates the breaking up of the crumbs into a finer state. An explanation of these facts is the increased or diminished aggregation of the soil, resulting from the freezing of the water in the soil. III. (*a*) The water-holding capacity of a coarsely granular soil is increased by the presence of even a very thin (3—5 cm.) difficulty permeable subsoil—*e. g.*, clay. The more so, the nearer the latter is to the surface. The effect is more marked the greater the difference in water capacity of the upper and lower soils. (*b*) An easily permeated subsoil only slightly increases the water capacity of the soil above it, if the latter is of a finely granular or argillaceous character, but diminishes its capacity if it is more coarsely granular.

THE SPRAGUE ELECTRIC TRAMWAY.

The Sprague Electric Tramway at the Sugar Refining Company's yards, East Boston, Mass., is in most successful operation. The cars on this railway are in use all the day long, the loads averaging ten tons per trip, and each round trip occupying five minutes. Horses were previously used, when each trip averaged fifteen minutes, with a load of one and a half tons. The heaviest load hauled by the Sprague motor as yet was eleven tons net, or, including the car, fifteen tons gross.

The mechanical application in the moving of the car by the motor is entirely satisfactory. There is no delay, the load is taken instantly, without noise or friction, and this in spite of the heavy coating of mud, sugar, and molasses upon the rails, forming by no means bad insulation. Yet the rails answer very satisfactorily as "return." The Edison dynamo used for lighting the premises runs the motor.

The result here is very satisfactory, and is very encouraging for those who desire to use the electric motors underground.

Some special difficulties are met with in mining, which point to the use of the storage battery locomotive as that which will best fulfill all the conditions.

THE DEVELOPMENT OF THE AMERICAN CHEMICAL INDUSTRY.*

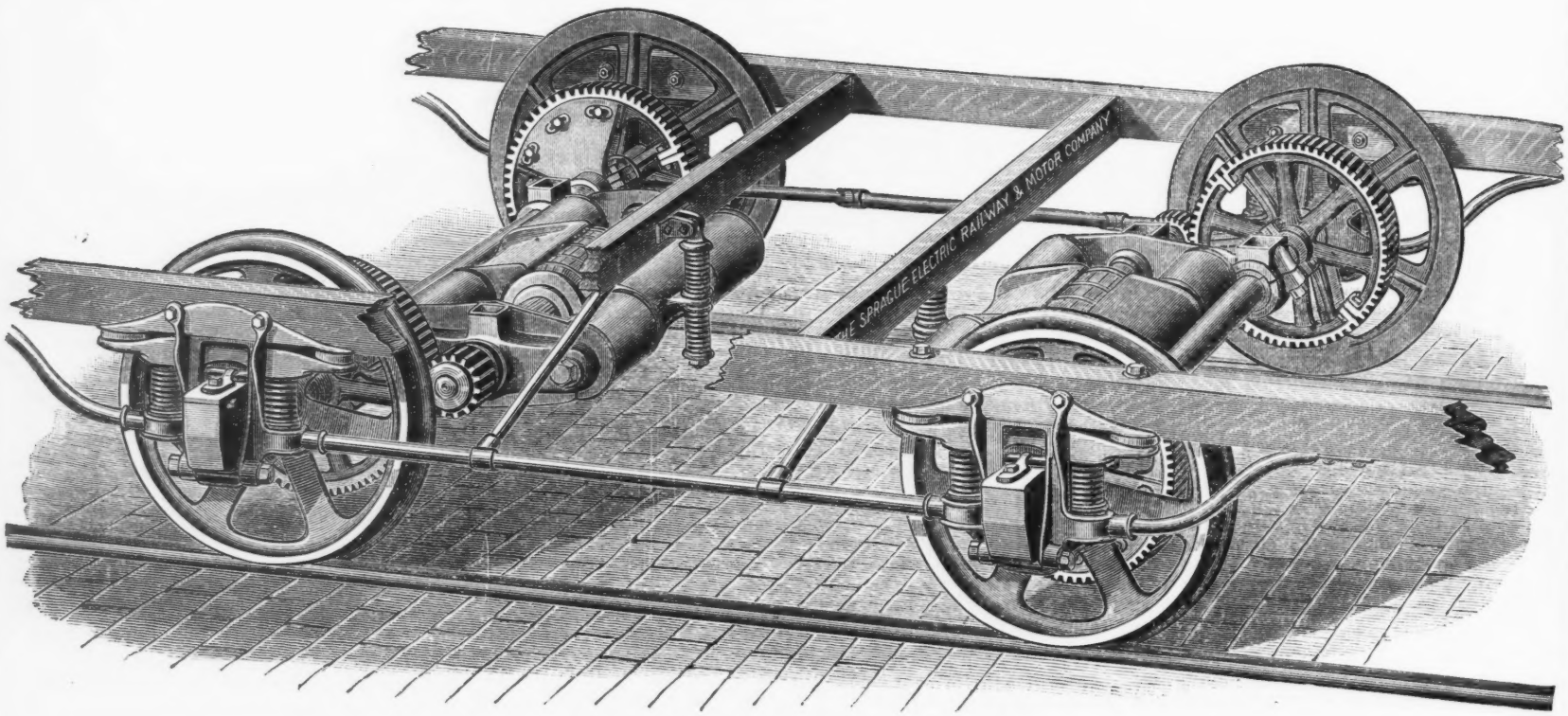
By Dr. Francis Wyatt.

(*Continued from Page 255.*)

CONCENTRATION.

Although it has long been conclusively proved, if not universally admitted, that no other means of concentration are worthy of comparison with the Glover tower for thoroughness, rapidity, and economy, it must be remembered that the average capacity of this valuable apparatus does not extend beyond 62° Beaumé, and that its product is consequently below the strength required for such purposes as the purification of petroleum and other mineral oils, the refining of gold and silver, the dissolution of indigo, and the manufacture of nitro-glycerine compounds. The last and certainly most troublesome operation must, therefore, be performed by means of separate and costly apparatus, and how it may be done with the greatest completeness and at the least possible cost, is a problem that has long occupied the attention and is still taxing the ingenuity, of industrial chemists and engineers the world over. It has been often asserted, and was, in fact, affirmed many years ago by the illustrious Liebig, that so far as the actual chemistry of sulphuric acid is concerned, we have nothing more to invent and nothing more to learn: the entire question having been now reduced to a simple commercial calculation relating to the prime cost of our raw materials. What has so long been wanted in this and other branches of the chemical industry, and what it is only just now beginning to acquire, are managers or directors who combine a thorough chemical knowledge with the most complete engineering skill, for, as all those who are acquainted with the subject will readily admit, our recent improvements are due, and our future progress entirely depends, upon the modifications or ameliorations that have been or shall be introduced into the various forms of existing apparatus. Thus, for example, the whole history of concentration and denitrification was revolutionized by the mechanical genius of Glover, when he gave us his tower, and nothing is more regrettable than the fact that so large a number, if not the majority of our own manufacturers, have not yet been prevailed upon to recognize its value. Had they done so, and were it everywhere adopted, it would be unnecessary even to glance at any other mode of preliminary concentration; but as matters stand, it behooves us to attempt a brief description of the more or less clumsy devices which still prevail in those works where primitive methods have not yet been discarded. To concentrate sulphuric acid—it need hardly be said—merely means to drive off its water in the form of steam, by subjecting it to a sufficiently high heat, it being a well-known fact that when the dilute acid is boiled, it may be raised to a temperature of at least 200 degrees C. and attain the strength of 60° B. without any loss of acid in the vapor. The acid from the chambers is therefore run directly into a series of leaden pans of varying forms of construction and heated either by a direct fire from the top or from the bottom, or by the waste heat from the pyrites burners, or the waste steam from the boilers. If any choice is to be awarded to either of these modes of evaporation, it must fall upon top heating; for, as the hot gas comes into direct and immediate contact with the acid, and the vapors produced are at once removed by the draught, it is evidently the quickest; while the pans are much less acted upon and freer from the danger of being burnt through, than those which are fired from below. The vessel must, however, be kept constantly full, and at an uniform level, in order to protect the lead from any direct contact with the flame, nor is this a matter of any difficulty, since the heavy concentrated acid continuously sinks downward and may be drawn off from the bottom, in a stream directly proportionate to that in which fresh acid from the chambers is allowed to run in at the top.

In works where it is thought best to heat the pans from the bottom, the latter are generally so arranged in sets that the weak acid from the chambers flows in at one end, in a regulated stream, and is transferred from pan to pan by over-flow pipes. The pans themselves in this case are placed on cast-iron plates, those at the fire end being very thick, to protect them from the extra heat, and generally lined with clay and fire-bicks. The fireplace comes under the strongest of the pans and the flame gradually travels towards the weakest, such an arrangement being required by the fact, that the concentration becomes more difficult as the acid gains in strength, and finally necessitates an enormous heat to raise it to the boiling point. According to the extensive and perfectly trustworthy experiments recorded by Bode, a series of pans having a total area of 118 superficial feet with a fire place of 6½ superficial feet, can concentrate, when properly constructed, 5 tons of chamber acid to 62° B. in every 24 hours, with a consumption of no more than from 12 to 14 per cent of its own weight of coal; while it has been shown by Scheurer-Kestner that by working with a set of 4 pans, of 6 feet 6 inches by 3 feet 11 inches each, at a time previous to the construction of his Glover towers, he was in the habit of producing 3 tons of concentrated acid, of 63° Beaumé daily, at an expense of only half a ton of coals. As to the cost of the apparatus used in this kind of concentration, it is stated to be considerably less than one thousand dollars, while that of the concentration itself, including coals, wages, wear and tear, is placed by excellent practical authorities at a maximum of $1 per ton. Some few years ago a Mr. James Stoddart suggested that it should be easy not only to produce acid of 1·700 specific gravity in lead pans by heating that from the chambers to 300 degrees F. in a current of air, but to effect its complete concentration in the same way by merely raising the temperature to 500 degrees F. His views were confirmed by Mr. Galletly, who in fact succeeded, in the laboratory, in concentrating a gallon of brown vitriol in a small leaden box, with a depth of acid of from 4 to 6 inches, and a temperature varying from 190 C. to 240 C. until its specific gravity was 1·840. In recording this experiment, the latter chemist declared that he paid particular and special attention to the lead of the box, and stated that owing in his opinion, to the comparatively low temperature at which the work had been done the metal had been practically unacted upon. These facts having led to an animated discussion and a great deal of incredulity, he repeated his experiments, producing this time, however, 5 gallons of concentrated



THE SPRAGUE ELECTRIC TRAM CAR.

* Copyright by the Scientific Publishing Company, 1887.

acid of sp. gr. 1·830, from vitriol of sp. gr. 1·745, and using a temperature of 205 degrees C. and 16½ cubic feet of air. He was, however, compelled to confess that the loss of monohydrated acid was very great, that it amounted in short to nearly 13 per cent. owing to its evaporation during the process, in a vesicular state; and for this reason, probably, rather than for any other, the method received no practical application and has since remained unnoticed.

The idea of employing superheated steam for the purposes of this kind of concentration, originated with a chemist named Carlier, who was managing a chemical works at Duisburg in Germany, and it has been taken advantage of to a very great extent in numerous continental factories. The acid is run off from the chambers into lead lined wooden tanks of about 12 feet square, provided at the bottom with two coils of lead-pipes 150 feet long and about ½ inch internal diameter. Steam is forced through these coils and maintained at a very high pressure, and when the specific gravity of the acid attains 1·709 it is run through a serpentine coil of pipes into a second tank, where the concentration continues. By this means 5 tons of chamber acid can be concentrated to 1·700 in every 24 hours, with steam at a pressure of 45 pounds to the square inch, and with no more coal than is equal to 9 per cent of the finished product; it therefore certainly possesses the two important advantages of using too low a temperature to incur much loss, and of preventing the contamination of the acid by any extraneous impurities.

Calmly considered, however, all these methods are, without exception, eminently unpractical and unsatisfactory, being, as we have seen, not only complicated, cumbersome and costly, but altogether incapable of raising the acid beyond the degree to which it may be so easily brought in the Glover tower at no cost at all. There is consequently no reason for their continued existence, and it will be very satisfactory when the world is entirely relieved of them. We might have stopped at this juncture if the acid of 62° Beaumé could be made to effectually answer all industrial purposes, and we should seek for no further arguments to prove how it is best obtained. This is, however, unfortunately not the case, and we have still to consider that most difficult and expensive branch of its manufacture, which commences when it has already acquired that strength, and which is universally conducted either in glass retorts or in platinum stills.

The absolute superiority of the platinum still appears to require further demonstration, and is, indeed, so far an open question that a great number of important factories continue to use glass, and to justify the preference on the ground of economical working.

(TO BE CONTINUED.)

A HISTORY OF THE "SLIDING SCALE" SYSTEM OF "PROFIT SHARING" IN THE PENNSYLVANIA COAL MINES.—I.

The wages question is always one of absorbing interest to those who receive and to those who give; to the first because it is their means of living, and to the second because the price of the products of labor depends, in a great measure, on the rate of wages paid. Looking over history it would seem that there is a constant, never ending strife between the employers and the wage receivers, a strife marked by frequent "strikes," "lockouts," and, happily, in recent years, by arbitrations also. Various plans have been proposed by which the constant war between these two classes may be avoided and by which the laborer may participate, as it is eminently just he should do, with the employer in the benefits of higher prices for the products of labor. We propose to trace here the history of the efforts which have been made in Pennsylvania to effect this desirable end, under what is commonly known as the Basis or Sliding Scale System of wages. In this a certain rate of wages is agreed upon as fair when coal sells for a given price per ton. These wages and prices of coal being styled the "basis." As the selling price of coal goes up or down from this basis, the rate of wages goes up or down with it, in a predetermined ratio. There is, however, a minimum and a maximum point below or above which the rate of wages is not allowed to go, whatever may be the price of coal.

The following information regarding this very interesting and important subject has been compiled from official and reliable sources in all cases, and it places upon record one of the most important phases of the labor question, and will serve as a book of reference in future where this subject may come up for discussion.

The question of what rate should be adopted as the *basis* from which prices and wages are to be calculated will necessarily be one for special consideration in each case. It is a purely arbitrary figure and is of far less importance than the proportion in which wages are to rise or fall with the varying market prices of coal. It is clear that the basis in wages will depend on the cost of living, and the current rates of wages not paid under this system, so that what may be a perfectly fair basis at one time may be a very unjust one under different conditions. The basis itself is therefore subject to change; but it nevertheless offers a just plan by which the interests of the laborer and his employer become in a measure identical, and its adoption has certainly prevented some, though unfortunately not all, strikes in the Pennsylvania anthracite fields.

THE SLIDING SCALE SYSTEM OF WAGES IN THE SCHUYLKILL COAL REGION, PENNSYLVANIA.

The Anthracite Board of Trade of the Schuylkill Coal Region, consisting of representatives from various associations of coal operators, was formed on November 13th, 1869, with Mr. William Kendrick as President. On the part of the workingmen, organizations had already been effected under the general title of The Miners' and Laborers' Benevolent Association. These were divided into districts, sending representatives to the executive committee, the head of the county organization.

A general council of the "Workingmen's Association of the Anthracite Coal-Fields of Pennsylvania," was formed at Hazleton, March 17th, 1869, representation being allowed the different counties as follows: Schuylkill, 4; Luzerne, 4; Carbon, 3; Northumberland, 3; Columbia, 2; Dauphin, 1.

In January, 1869, the prices of coal as measured by the auction sales of Scranton coal averaged $5.21 per ton f.o.b. Hoboken. A figure which after the experience of war prices appeared low. There was much depression on the market and the February sale, which averaged only $4.36 per ton, brought consternation to the miners, who clearly foresaw a reduction of wages impending. The April sale averaged but $4.79 per ton, and it was then decided that something must be done to bring up prices, consequently on April 29th, 1869, Mr. John Siney, as President of the M. & L. B. A. for Schuylkill County, ordered a general suspension of all work except rock-work, timbering and repairing, to take effect May 10th.

On June 4th, 1869, the Executive Committee of the coal associations of the Schuylkill region submitted the following propositions for establishing wages to the men.

"1. Prices of labor to be regulated by prices of coal, taking the average of all sizes at Port Carbon: the percentage to be regarded in making the average to be—larger sizes, 75 per cent; chestnut, 12½ per cent, and pea, 12½ per cent.

"2. When the average price of coal is $3 per ton at Port Carbon, outside labor to be $11 per week; platform men, $11.50 per week; inside labor, $12 per week; and miners, $14 per week, clear of costs.

"3. For each advance of twenty-five cents per ton in coal at Port Carbon, an advance of fifty cents per week and five cents per wagon; and for each decline of twenty-five cents, a similar reduction. Yardage to be in proportion.

"4. The advance and decline in price of coal to be determined by a board of five operators, to be appointed by the Workmen's Benevolent Association, who will pledge themselves to make a true and correct statement of their sales for each month.

"5. The rates of wagon-work and yard-work to be those now existing at each colliery on which the advance or decline is to operate, unless modified by amicable agreement between the employer and employé.

"6. No stoppage of work until a notice of six days has been given.

"7. If any colliery in this association is prevented from starting by reason of any threats against bosses or other employers, or by reason of any attempted dictation as to who shall, or who shall not be employed, whether as boss or other employé, we, as representatives of the Coal Association, pledge ourselves to remain idle until such colliery be able to start wholly free from any such restraint or interference.

"8. We also require that the local committees shall abstain from all illegitimate interference with the working of the collieries."

In answer to this proposition, the General Council of the W. B. A. met at a meeting at Mahanoy City, June 9th, and after stating that the object sought to be attained by the suspension, namely, the depletion of the overplus of coal in the market, had been attained.

"*Resolved*, That on and after the 16th inst., all districts or branches which can agree with their employers as to basis and conditions of resumption, do resume work."

The Executive Board of the W. B. A. of Schuykill County thereupon met, and made the following proposition for a basis on which to resume work:

"That we demand for outside labor $11; platform men, $11.50; inside labor, $12; and miners, $14 per week, when working on wages—all inside work to be clear of expenses; also, that contract work be raised in accordance therewith; this to be asked when coal is at $3 at Port Carbon.

"That we receive one-fifth of all advances thereafter, and all reduction to be taken off in accordance to the above advances.

"The advances and reduction to be on all sizes above pea."

The reason given for declining to consider the question of "interference," as presented in the operator's proposition, was that the men claimed no such right.

The proposition of the W. B. A. being but little different from that of the operators it was accepted and work was resumed.

The prices of coal were reported in writing by five firms, upon the 25th of each month, and the wages (given in the following table) were based upon the average so obtained:

1869.	Average price of coal at Port Carbon.	Scale of wages.	Wages paid per week. Miners.	Inside labor.	Outside labor.
June		10 per cent above basis	$15.40	$13 20	$12 10
July		15 " " "	16.10	13 80	12 65
August		35 " " "	18.90	16.20	14.85
September	$2.89	Basis	14.00	12 00	11.00
October	3.44	10 per cent above basis	15.40	13 20	12.10
November	3 75 1-5	15 " " "	16.10	13.80	12.65
December	2 74	Basis	14.00	12.00	11.00
Averages	$3.20½		$15.70	13.43	$12.33 4-7

(TO BE CONTINUED.)

Petroleum-Burning Locomotives on New York Elevated Roads.—The Manhattan Elevated Railway Company, of this city, has given engines burning petroleum a trial, and if the company can be assured of the economy and safety as well as of the mechanical perfection of the device, the engines will probably be used on the lines of the elevated roads. It is estimated that a round trip with oil would cost about $3, but the average cost of coal is not more than $2 a trip.

The Use of Oil at Sea.—The Nautical Society of Hamburg, Germany, has offered a prize of 500 marks for the best essay on the subject of calming the sea by the use of oil. An exhaustive description of experiments of the effect of oil made up to the present time is required; also a criticism of the arrangements used so far, and especially complete directions for its use by large steamers and sailing vessels, as well as small vessels, pilot, fishing, and life-saving boats, besides directions for the use of oil at sea and near the coast. The essays are to be written in English or German, and sent before November 1st, 1887, to the President of the Nautical Society, Director of the Navigation School, Captain F. E. Matthiesen, Hamburg. Competition is not limited by nationality.

THE GOLD-FIELDS OF SOUTH AFRICA.

By R. W. Murray.

Special Correspondence of the Engineering and Mining Journal.

The gold discovery in this part of the South African continent and the industry to which it has given birth arrests the attention of the outside world quite as much as the discovery of diamond mines has done. It seldom occurs in the history of a country that two such discoveries are made in it within twenty years, as these have been. In 1868 it was not suspected that there were diamonds or gold to be found in any portion of the country. In 1869 the first diamond was sent down to Capetown from Griqualand west to Capetown and purchased by the Governor of the Cape Colony for £500. During the period which has elapsed since that time, diamonds to the value of over £50,000,000 (fifty millions sterling) have been exported to Europe, America and elsewhere. Now it is discovered that certain portions of the Transvaal contain gold in great abundance; it is said in much greater abundance than in any part of the known world. This is the more remarkable seeing that from 1859 to 1862 the Cape Government spent tens of thousands of pounds on the employment of mineralogists and geologists, all said to be eminent in the European "world of science," to make a scientific investigation of the whole of the South African continent and report on its mineral resources, when every one of them, without exception, reported that by no chance whatever could there be a precious stone or a bit of gold found in South Africa. Thereupon the people of this country gave up all idea of searching for either.

It was by the merest accident that the existence of diamonds was detected, and the same may be said of the discovery of gold. In 1867, Herr Mauch, a German explorer, was making his way from Polchefstrom, the original capital of the South African Republic, through the vast territories which lie between that part of the country and the Zambesi. Mauch was an accomplished botanist and mineralogist, but his passion for botany absorbed the whole of his thought and labors. While, however, he was working to enrich the botanical institutions of the continent with which he was connected, he sometimes devoted himself to the examination of rocks and soils, and he it was who first insisted that this was a gold-field sufficiently rich to carry a large population. Reporting upon this discovery he said: "There are mountains of gold, the rocks and the soil are full of it."

The press of the country sneered, the people refused to believe, and it was asked why, if this discoverer found himself surrounded by the precious metal, he did not load up his vehicle with it instead of wasting his time in looking for plants and flowers. It is not in the nature of mankind to understand that to some men there can be pursuits more entrancing than the getting of gold. However, some little time after, in about 1868, when diamonds were being talked of, it was rumored abroad that men were quietly at work, at a spot named Pilgrim's Rest, finding gold in fair quantities, and some Australian diggers came over and commenced digging there; but the chief part of them, finding the gold patchy, returned home again, although some of them amassed fortunes. But the ruptures which occurred in reference to the retrocession of the country from the British Empire and the Secocoeni war, led to the abandonment of Pilgrim's Rest, and, with the exception of gold mining companies which were started to work the Leydenberg properties in 1882 and 1883, gold digging was abandoned up to 1886, when a Mr. Edwin Bray, a railway contractor; Mr. Marks, of a firm of diamond diggers and merchants; and Mr. Barber, another diamond digger, gave out that they had discovered gold reefs in abundance on the Sheba range, which are situated between Pretoria, the new capital of the South African Republic, and Delagoa Bay, 300 miles distant from the former and 120 miles from the latter.

Gradually people were attracted to that part of the country, and in September of last year a company named the Edwin Bray, working on the Sheba property, having paid 60 (sixty) per cent to its shareholders, there was a rush for the Barberton gold-fields. Companies were formed, scrip issued, and a gold scrip mania seized upon the whole population of South Africa, and a large number of people, attracted by the reports that were sent abroad of enormous fields, came from other countries. The diamond fields were denuded of their population, and the diamond market, where diamonds and diamond scrip were the staple of business, became the chief market for dealing in gold scrip. Rings were soon formed, and the scrip of all the gold companies commanded very high premiums.

About this time it was rumored that gold had been discovered in a locality named Witwatersrand, which is situated between the diamond fields and Pretoria. The distance of Barberton from Kimberly diamond fields is 600 miles; Witwatersrand about 268. After a little time prospectors proved to the government of the Transvaal that Witwatersrand was auriferous and it was proclaimed a gold-field, but by that time the town of Barberton had grown as large as the capital of the country, with its stock exchange, hotels, clubs, churches and music halls.

I left for Barberton in the month of December last, and when I passed through Witwatersrand on New Year's Eve, the town, since named Johannesberg, consisted but of one long street of daub shanties and canvas tents with a wooden structure in the center, disgraced by the name of the Central Hotel. There was a large traffic going on, but Barberton was the goal for which the bulk of the people had started.

On arriving at Barberton I confess to being astonished, notwithstanding all I had heard about it, to find such a large and handsome town; but I soon saw that it was not founded on anything like the rock of solid and remunerative industry on which alone such places can become permanently prosperous. The stock exchange swarmed with brokers and speculators. There was, however, no swarm of diggers to be seen around the mining centers. The brokers' share lists revealed the startling fact that there were 51 companies in existence representing £2,000,000 (two millions sterling) of capital; one company alone was producing gold in large quantities and that company was the only one that had declared a dividend; there were not five companies working for gold and yet scrip fluctuated in price from day to day until the £2,000,000 of scrip had been inflated to £5,000,000. It was clear enough that the Barberton Stock Exchange was little better than a gambling hell, and that ruin to the community must soon follow. It has followed. The scrip for the most part became unsaleable about two months since and so continues. But there is plenty of gold in the Barberton district, and now when the scrip gambling is no longer possible, the companies are working in right good earnest, and gold is being exported from there in fair quantities.

On returning from Barberton to Witwatersrand I made a tour of the whole district, and was soon convinced that Barberton would be discovered before long to be a less desirable gold-field than Witwatersrand. The formation of the country is altogether different. The Barberton district is continuous ranges of mountains and hills, creeks and gorges. The country abounds with gold, but the cost and difficulty of working are very great. To get machinery and provisions to the various mining centers involves great labor and much money. I saw eight bags of meal, 1200 pounds, taken in a wagon up the Sheba Hill, and it necessitated the employment of twenty-two oxen, two horses and four men.

The Witwatersrand district is much nearer the towns from which provisions and machinery have to be brought; the country is undulating, gentle slopes, with wavy hills, nothing to impede traffic; the roads are nearly level, and there is fine back country. The extent of the gold-fields cannot yet be determined. Rich gold reefs have been found over at least 150 square miles of country, some of them yielding 10 ounces to the ton, and in one case 13 ounces has been realized. There must be now something like a population of 10,000 to 12,000 in the Witwatersrand town (Johannesberg) and gold country, and about 5000 in Barberton and its neighborhood. The town of Johannesberg has been built up since January last, when the original town was swept away, it being found that some of the principal gold reefs ran across the street and under the houses, and the present site of the town was fixed upon by the government, as the locality appeared to lie between the principal gold centers, and no reefs cropping up through the surface. There is what is called "the main reef" running along a distance of about 45 miles already traced. The ore, or banket,* from this reef gives from 6 ounces to 13 ounces to the ton.

There are 110 gold mining companies already established representing capital to the extent of £4,000,000. There are very few companies whose shares are not quoted at a premium. A large proportion of the companies have imported batteries which range from 5 to 100 stamps. The largest battery is of 100 stamps, worked by two 60 horse-power engines. Steam machinery is going the whole of the fields over. The getting out of ore is generally performed by underground working; there are drives and shafts on nearly all the gold properties, and the gold industry of the Transvaal is by far the largest and most remunerative South Africa has ever known. As yet, there has been no register kept of the gold exported, but this will shortly be enforced, when it will be easy to give statistics showing what the gold industry is worth to the country.

Farms on which gold reefs are found to exist, change hands at large figures. Boers who all their lives have lived on biltong and bean coffee, dressed in mole skin jackets and home-made veldschoens, are now wealthy, have large balances at their bankers, and dress, if not in "purple and fine linen," certainly in the finest broadcloth to be obtained for money; their sons are mashers and ride the high horse, whilst their wives and daughters, who never wore a stocking before the age of gold set in, drive out in gorgeous array. The whole aspect of the country and its people is changed.

There is one great advantage which people have who are settling here. Every kind of produce is very cheap and there is plenty in the land. The soil of the Transvaal is surprisingly fruitful and the climate is charming. We have cold mornings and evenings even in the summer, in winter there are sharp frosts, but the cold is never intensely severe. Unlike other parts of South Africa the seasons are marked; there is spring, summer, autumn and winter, each season bearing its characteristics as in Europe or America.

The Cape government has offered to extend the Colonial Railway from the Kimberly terminus to Pretoria via the Witwatersrand gold-fields. When that is done we shall make the journey the whole distance from Capetown in about three days.

Transvaal, S. Africa, Aug 27, 1887.

England and America.—This was the title of a lecture recently delivered in the Trophy Room of the American Exhibition in London by Mr. J. S. Jeans, Secretary of the Iron and Steel Institute, and was the first of a series promoted under the auspices of the London Workingmen's Association. In the course of his remarks the lecturer said that the American resources were infinitely in excess of those of Great Britain, and unless the working population of the latter country were to atone for their deficiencies in this respect by greater industry and a more extended use of mechanical appliances, so as to economize labor and produce cheaply, they would not be likely to hold their position in the race. There was not much danger of American competition in manufactured goods for a long time to come. Fully 80 per cent of the exports from America took the form of raw materials. If American protection were continued at its present range England would not have much fear as regard manufacturers; but if the tariff were abolished the industrial prospects of England would become very much blacker in consequence of the enormous resources that America possesses for cheap production. The lecturer concluded by referring to the extent to which national prosperity and industrial prospects were affected by military and naval expenditure. He mentioned as a striking fact that was at variance with the general opinion of economists and politicians, that the United States had actually since 1861 expended 921 millions sterling on their army and navy, as against 626 millions sterling in England. But at the present time the annual expenditure on this account in Great Britain was £55,000,000 to £40,000,000 a year, as against about £13,000,000 in America, so that the English *per capita* expenditure was about 20s. as against 4s. 2d. in the United States. America had, however, the further advantage of having only a comparatively small handful of men withdrawn from industrial and productive occupations for military purposes, whereas England has over 200,000 of the flower of its manhood that were not only producing nothing, but hanging like a dead weight around the neck of the productive community.

* Banket is a name given to the ore, which is a conglomerate full of pebbles, from its resemblance to an almond sweet made in large quantities by the Dutch.

How Colliers were Paid by Our Great-Grandfathers.—A highly entertaining lecture was delivered at the last monthly meeting of the Newcastle Society of Antiquaries by Mr. J. Robinson, who in the course of his remarks was able to exhibit some old pay-sheets of a Delaval Colliery, dated 1745. According to these interesting documents, the wages of an ordinary laborer at that time was 3d. per day, while the "boss," or superintendent, received the handsome salary of £20 per year. As an illustration of the variation which has occurred in the purchasing power of money since the middle of the eighteenth century, it may be noted that whereas the total pay-sheet amounted at the time mentioned to only £44 per month, the sum now handed over to the workmen for the same period at the same place in our own day is never less than £10,000. The first of the old pay-sheets is from February 23d, 1744, to March 23d in the same year. In it there are, first, payments for nails and other stores to the amount of £3 0s. 6d.; then the wages of some persons employed in mending pit gear, 17s.; and then a number of persons have their wages detailed, and the wages of these men and boys, employed probably in ventilation, varied from 8d. per day to 1s. Three screeners were employed—16 days, 14 days, and 3 days each in the month respectively—and they only obtained 6d. and 10d. each per day. A comparatively large number of men and boys were employed in stone work at from 3d. to 1s. per day. The second sheet is the more complete of the two. It is from March 23, 1745, to April 27, and is for £49 2s. 8d. in the total. Of this "£43 13s. 8d." form the underground charges. The hewing of "248 scores at 2s." cost £24 16s., and the putting of the same quantity was, at 11d., £11 7s. There were 26 yards of headways charged for at 14d.; 18 yards at 9d.; 15 yards at 8d.; and 11 yards at 15s. The walling cost 4d. per yard; the "bords turning" 12d. A lad "keeping the trapdoor" put in only "three days at 3d. per day," whilst the barrowman had "four days at 12d." and the overman rejoiced in the heavy wage—"five weeks at 6s.—£1 10s." "Upperground" the total charges were, "banking 248 scores a 3d.," the "banksman, four weeks at 1s. 6d.," the driver of the horses had sixteen days at 8d.; "corving"—in the days before cages—"corving 248 scores at 2d.," and there were some smaller items added. The deductions from the bills were—"picks and candles, £1 13s. 6d.; and master's horse, 12s. 6d." Wages for the working miner varied from threepence a day to one shilling, while at that time they only worked sixteen days for the four weeks.

Manufacture of Artificial Rubies.—Most people will remember that some years ago the distinguished French chemist, M. Fremy, succeeded in producing a series of very small ruby crystals by means of a combined physical and chemical process, and that, as they were too small to compete from a standpoint of commercial value, with the natural stones, the experiment, although interesting in itself, was considered to be nothing more than a scientific curiosity.

With the persistency truly characteristic of all real lovers of original research, M. Fremy has continued his experiments, despite his first failures, and now claims that he can manufacture crystals of most excellent quality, and far larger than any natural rubies commonly used. This result has been obtained by a new process. The older processes of 1877, employed by M. Fremy and M. Feil, consisted in heating to a white heat in an earthen crucible a mixture of aluminium and minium. The red coloration was produced by bichromate of potash. The operation was often made with 20 to 30 kilogrammes of mixture and gave several kilogrammes of rubies. Another method was to heat to a high temperature a mixture in equal parts of aluminium and fluoride of barium with traces of bichromate of potash. The crystals thus obtained were remarkable for their neat form, but they were apt to be lamellar. In his recent experiments M. Fremy had the assistance of a talented young chemist, M. Verneuil, attached to his laboratory at the museum. Their first work was to find whether the earthenware crucible of the early experiments influenced the reactions, and they found it did not. Next they found that almost all the fluorides when mixed with alumina produced corundum by calcination at white heat. Fluoride of barium, fluoride of calcium, and cryolite were used by them. Crucibles of platinum were also employed. In the course of the experiments they found that a fluoride, such as fluoride of calcium, exercises on alumina an enormous power of mineralization. Thus they could crystallize all the alumina contained in a mixture of 1 part of fluoride of calcium and 12 parts of alumina. In order to investigate this fact further they placed at the bottom of the calcium crucible some natural fluoride of calcium, white and transparent, and of great purity. It was covered carefully by a plate of platinum perforated with very fine holes. On the plate was put a layer of alumina obtained by calcination of pure ammoniacal alum. Thus charged the crucible was heated for several hours at red heat in an earthenware crucible, and it was found that the fluoride of calcium had almost completely transformed the alumina into crystals of ruby, remarkable for their neat form and their rose color. Thus alumina, without being in contact with fluoride of calcium, and simply affected by the emanations of the fluoride, calcined in the air, is mineralized, losing its amorphous state, and changing to a crystalline mass. This discovery is important in the science of mineralogy. It shows how such bodies as the fluorides, heated in contact with moist air, produce emanations which can crystallize amorphous bodies, such as aluminium-Hydrofluoric acid, acting at a very high temperature, may play a considerable rôle in the reaction.

Occurrence of Apatite in Metallurgical Slag.—Under this title we find a most interesting communication to *Nature*, by Mr. W. M. Hutchings, who claims to have remarked the formation of apatite crystals in fused silicate magmas produced during the smelting of lead ores in the blast-furnace. In his own words the author says: "The slag in question is a basic silicate of lime and ferrous oxide, containing about 30 per cent of silica. The principal 'flux' used in the reduction of the ore is 'tap-cinder' from the puddling furnaces, and it is mainly from this source that phosphoric acid is introduced into the slag. The slag itself, in bulk, is dark brown to nearly black in color. It flows into slag-pots of about 3 hundredweights capacity, and cools slowly. I recently prepared some thin sections of this slag for microscopic examination. The greater portion consists of a mass of crystals of olivine, surprisingly colorless and transparent considering how much iron is present. The spaces between the crystals are occupied by deep-brown and yellow amorphous slag, and black sulphides of iron, etc. Both olivine crystals and dark amorphous matter are penetrated through and through by great numbers of apatite crystals in long needles. It is a most beautiful occurrence, analagous in every way to what one sees in rocks.

"Nearly all the apatite crystals have taken up and inclosed more or less of the amorphous dark material, which forms in the majority of cases a rod running down the center, but there are also many cases of symmetrical arrangement of dark matter parallel to the sides of the hexagon. The apatite does not only occur in the mass of the slag as above described; it is formed also in free crystals, lining cavities which are formed in the center of the lumps of the slag owing to gases carried over from the furnace and liberated during cooling. Some of these cavities are of considerable size, and are often lined entirely with a thick growth of apatite needles, some as thin as the finest hair, others of much larger dimensions. I have taken out crystals over a quarter of an inch long for microscopic and chemical examination. Most of them contain a good deal of the amorphous slag, etc., inclosed, as in the case of those in the mass of the slag. Sometimes in such cavities very beautiful little crystals of volatilized sulphides are seen among and on the apatites. I have seen galena crystals in this manner, but it is very difficult to remove them from the cavities without damage or loss."

Mr. Hutchings concludes by earnestly calling the attention of all those connected with metallurgical processes to his discovery, with a view to its fuller development.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price? These notices do not supersede review in another part of the Journal.]

Pittsburg Coal Region. Pennsylvania Geological Survey Annual Report, 1886. *Part* 1. By J. P. Lesley, State Geologist. Published by the Board of Commissioners Second Geological Survey of Pennsylvania, Philadelphia, Pa. 1887. Pages 573 and Index. Illustrated.

Die Metallurgie. Gewinnung der Metalle. By Dr. C. Stölzel, Professor of Chemistry and Metallurgy at the Royal Bavarian Technical High School, Munich. Published by Friedrich Vieweg & Son, Braunschweig, Germany. 1886. Pages 1626, and Index. Illustrated. Price, $17.

Handbuch der Eisenhüttenkunde. By John Percy, Professor of Metallurgy at the Government School of Mines, London, England. Translated and edited by Dr. Hermann Wedding, Royal Prussian Geheim Bergrath. Published by Friedrich Viewig & Son, Braunschweig, Germany. 1887. Second Supplementary Volume. Pages 272 and Index. Illustrated. Price, $5.

Geology of the Vegetable Greek Tin-Mining Field, New England District, New South Wales. By T. W. Edgeworth David-' B.A., F.G.S., Geological Surveyor. Geological Survey of New South Wales. Published by the Department of Mines Geological Survey. Branch: Sydney, New South Wales. 1887. Pages 169 and Index. Illustrated.

Mining and Mineral Statistics of New South Wales. Report for 1886. By the Department of Mines, New South Wales. Published by the Government, Sydney, New South Wales. Pages 212, Index and Appendix. Illustrated.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED OCTOBER 11TH, 1887.

371,171. Manufacture of Horseshoe-Nails. Chas. H. Burckett, Brooklyn, N. Y.
371,186, 371,187. Process of and Apparatus for Making Ammonia. Thomas B. Fogarty, Brooklyn, Assignor to John A. Balestier, trustee, New York, N. Y.
371,194. Oil-Bag for Distributing Oil or Water. Edwin A. Hayes, New York, N. Y.
371,214. Steam Engine. Benj C. Pole, Camden, N. J.
371,216. Oil-Cup. John H. Porter, Jackson, and Peter Miller, Ypsilanti, Mich.
371,233. Retractory Lining for Metallurgical Furnaces. Thos. Twynan, Minford Gardens, County of Middlesex, England.
371,248. Process of Coating Iron with Tin or its Alloys or Other Metals. Edw. D. Braddock, Medford, Mass.
371,256. Oscillating Steam-Engine. Jas. Clark, Medina, N. Y., Assignor to Henry W. Clark, same place.
371,256. Apparatus for Forming Sheet-Metal by Electro-Deposition. Elisha Emerson, Providence, R. I., Assignor to the Rhode Island Copper Company, same place.
371,297. Hand Rock-Drill. August J Becker, Mount Carmel, Ill.
371,298. Method of Blasting Earth. Henry H. Bourne, Manhattan, Kan.
371,209. Metallic-Piston-Rod-Packing. Theodore Falk, Chicago, Ill.
371,313. Stone-Saw Gang and Sand Feed Combined. Cyrel W. Green, West Rutland, Vt.
371,321. Device for Renewing Valves and Valve-Seats. George W. Hollingsworth, Philadelphia, Pa.
371,324. Gas-Regulator. Hyam J. Hyams, Pittsburgh, Pa.
371,333. Explosive Safety-Plug for Boilers. George W. Layman, John A. Dempsey and Thomas Coppinger, Bolivar, N. Y.
371,334. Regenerating Furnace. Wm. J. Lewis, Pittsburg, Pa.
371,337. Machine for Making Cut Nails. Richard A. Mapp, Lynnhaven, Va., Assignor of one third to Harry Robinson Mapp, same place.
371,359. Rolls for Reducing Old Rails to Angle-Bars. Jacob Reese, Pittsburg, Pa.
371,367. Cupola Smelting-Furnace. Charles Sahler, Cologne, Prussia, Germany, Assignor to Friedrich August Herbertz, same place.
371,376. Explosive. Hermann Schoneweg, Dudweiler, near Saarbrücken, Prussia, Germany.
371,382. Furnace-Front for Boilers. James C. Shuler, St. Joseph, Mich.
371,389. Apparatus for Sinking Shafts through Quicksand. Wm. S Smith, Chicago, Ill.
371,407. Ratchet-Drill. Ebenezer Beals, Norwich, N. Y.
371,424. Machine for Grooving Wire. Patrick Clifford and Joseph Coupal, Wollaston, Mass.
371,427. Jig for Separating Ores. Gurdon Conkling, Glens Falls, New York.
371,436. Method of and Apparatus for Starting Electric Motors. Leo Daft, Plainfield, New Jersey.
371,433. Reversing Mechanism for Electric Motors. Frank E. Fisher, Detroit, Mich.
371,454. Puddling and Heating Furnace. Thomas F. Hemmick, Reading, Pa.
371,503. Process of Manufacturing Salt from Brine. Hascal A. Hogel, Yonkers, N. Y.
371,505. Reducing Valve. John W. Hyatt, Newark, N. J.
371,523. Amalgamator. James A. Sperry, Brooklyn, Assignor to C. Amory Stevens, Woodsburg, and Frank Sperry, New York, N. Y.
371,531. Method of Operating with Electrical Conductors. John E. Watson, Louisville, Ky., Assignor to the International Electrical Company, same place.

THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page* 261.)

Effects of Copper: Redshortness.—The chief effect of copper, like that of sulphur is to render steel redshort and to destroy its welding power: but its influence has been greatly exaggerated. Steel may contain 0·85 and according to Choubly 0·96% of copper without serious redshortness, and W. W. Scranton[a] habitually makes Bessemer T rails with 0·51 to 0·66%, which he states are so non-redshort that, in spite of their thin flanges and the exceptionally low temperature at which they are finished, only from 1·25 to 2·5% of them are sufficiently cracked to be classed as second quality. Eggertz[b] indeed stated that 0·5% of copper rendered steel worthless, but it is evident from Table 35 that this can only be true under special conditions if at all. I know not what percentage of copper is required to produce redshortness, but 2% appears to destroy hot-malleableness completely, for Billings,[c] melting 2% of copper with a remarkably pure weld-iron, found the resulting alloy so redshort that in forging it crumbled into grains: and Mushet reports steel melted with 5% of copper as "useless for forge purposes."[d]

The evidence as to the effects of copper on weld metal are less harmonious. The illustrious Karsten[e] found that 0·286% of copper (remaining from 1% introduced into the charcoal refining hearth) sensibly affected the welding power of weld metal: Stengel[f] reports that puddled iron with 0·018 sulphur and 0·21% of copper was slightly redshort: of thirteen wrought-irons for chain cables tested by the U. S. Board to test metals one with 0·32 to 0·43% of copper stood lowest but one in welding power.[g] Clearly these weld metals are injured far more than ingot metal is by the same proportion of copper. In other cases the influence of copper is less severe than in the preceding, though still perhaps more severe than on ingot metal. Thus, of the only two other cupreous irons among the thirteen just referred to, one with 0·17% of copper stood highest but one in welding power, and one with 0·31% stood well in this respect, So too Eggertz reports that 0·5% of copper produces only traces of redshortness in weld metal.[b] Holley suggests that the excellent welding of the iron with 0·31 copper may possibly be due to the simultaneous presence of 0·34 nickel and 0·11 cobalt.[g] These incomplete data suggest that the influence of less than 0·2% of copper is not likely to be appreciable in weld iron, that of 0·30% not necessarily injurious and that of 0·34% at least occasionally serious.

Influence of Manganese.—Whether manganese counteracts the effects of copper like those of sulphur is not known: but from the fact that Nos. 3, 6, 7, 13 and 14 in Table 31 are not redshort, though they have 0·85, 0·35, 0·31, 96 and 0·48% of copper respectively with but 0·51, 0·07, trace 0·46 and 0·53% of manganese, it is not probable that the presence of this metal is as imperative in cupreous as in sulphurous iron and steel. No. 14 shows that the coexistence of much phosphorus and copper does not necessarily cause redshortness.

Other Effects of Copper.—It is not known whether the highest proportion of copper which commercial iron contains has any sensible effect beyond those just discussed. We have the following information concerning the alloys of copper with iron. All refer to alloys of practically carbonless iron with pure copper, except Mushet's, which were of steel (apparently crucible steel) with copper, and possibly Rinman's.

% Cu.	Description of the alloys.	
2±	Extremely redshort: weak when cold	a
5±	Useless for forge purposes: cannot take an edge	b
9±	Hard and brittle	b
16·7	Apparently stronger than the two preceding	b
20±	Extremely brittle, crystalline granular, fracture pale coppery gray	c
25	Separated: bottom of soft malleable copper	b
41·75	Very brittle; fracture uneven and crystalline; strongly magnetic	c
50±	Very brittle and fine-grained: strongly magnetic	c
67 to 89	Harder but not appreciably less ductile than copper (?)	d
80±	Less ductile than the following one: strongly magnetic	c
83·4±	Decidedly redshort: much harder and tougher than copper	c
94±	Extremely ductile: stronger than copper	c
94	Harder than copper; magnetic	d

a, Billings, loc. cit.; b, Mushet, loc. cit.; c, Percy, loc. cit.; d, Rinman, Matls. of Engineering, Thurston, III., p. 183; e, Riche, idem.

While the alloys of copper with a little iron hold out some promise (sterro-metal, a brass with 1·77 to 4% iron and 0·15 to 1·5% tin has much higher tensile strength than brass proper) alloying iron with small quantities of copper is not an alluring field.

CHAPTER VIII.

The Metals Occurring but Sparingly in Iron.

§ 145. A. Zinc.—The alloys of this metal with a little iron appear to be tolerably stable. In galvanizing, *i. e.* zincing iron, the molten zinc gradually attacks the iron vessels, and a zinc-iron alloy collects at the bottom.[h] Several analyses of it give from 3 to 9·4% of iron. The alloys of iron with a little zinc are extremely unstable, evolving their zinc when heated, readily and apparently completely.

Parry's experiments prove that the vapor of zinc and of other metals may be temporarily absorbed but is apparently feebly retained by iron. Cast-iron, previously heated in vapor of zinc, cobalt, cadmium, bismuth and magnesium (each separately), after being cooled, cleaned with acid and filed bright, gave metallic sublimates when re-heated in vacuo. Gray cast-iron, when fused in closed crucibles with zinc, bismuth and tin (each separately) be-

* Copyright by the Scientific Publishing Company, 1887.

a Private communication.

b Wagners Jahresbericht, 1862, p. 9.

c Trans. Am. Inst. Mining Engineers, V., p. 450, 1877.

d Phil. Mag., loc. cit.

e Percy, Iron and Steel, p. 148.

f Idem, p. 151.

g Trans. American Inst. Mining Engrs., VI., p. 101, 1879.

h Percy, Iron and Steel, p. 153. Ledebur, Handbuch, p. 267.

Table 35.—Effect of Copper on Hot-Malleableness.

	Cupriferous steel known to be non-redshort.								
No.	Cu.	C.	Si.	Mn.	P.	S.	Reference.	Rolled into.	Behavior in rolling.
1...	·45	·28	·14	·78	·06	06	A	Rails	Perfect.
2...	·86	·23	09	·71	·05	·06	A	"	Almost perfect: the end made from the top of the ingot cracked slightly.
3...	·85	·31	·05	·51	·06	·11	A	"	Very good; slight cracks which closed up later.
4...	·35	·68	·10	·16	tr	.....	B	Krupp's gun steel	Presumably very good.
5...	·30	·46	·11	·18	0	.....	B	" " "	" " "
6...	·35	·52	·09	·07	0	.....	B	" " "	" " "
7...	·31	03	·17	tr	·25	·005	C	Wrought-iron for chain cables	Welded well. Others of similar composition welded rather poorly.
8...	·17	·02	·14	·03	·18	·007	C	" " " "	Welded admirably.
9...	·662	37	·05	·10	....	·10	D	Bessemer steel rails	Rolled well.
10.	·51@	·33@	·03@	1·05@	·05@	·05@	D	" " "	Steel within these limits gave 1·25 to 2·5% of second quality rails.
	·66	·38	·08	1·26	·06	·10			
11...	·21	.....	·098	....	.....	·02	E	Puddled iron	Some tendency to redshortness.
12...	·30	.....	.....	.....	.....	.....	F	Open-hearth steel	Extremely slight redshortness.
13...	·96	·49	·15	·46	·07	·04	G	Steel	Perfect.
14..	·48	·54	·12	·48	·19	·07	G	"	Perfect.

A = Wasum, Stahl und Eisen, 1882, p. 192. B = Kern, Metallurgical Review, II., p. 519. C = Holley, Transactions of the American Institute of Mining Engineers, VI., p. 115. D = W. W. Scranton, private communication. E = Stengel, Percy, Iron and Steel, p. 151. F = Willis, Journal Iron and Steel Inst., 1880, I., p. 98. G = Choubley, idem, 1884, I., p. 248.

came white, and, on heating in vacuo after cleaning with acid, gave distinct sublimates. Gray and white cast-irons made from zinciferous ores gave faint sublimates when heated in vacuo. Some of the zinc and cobalt sublimates were spectroscopically shown to contain these metals: the others were not examined. In one case iron gained ·05% in weight when heated in zinc vapor.[a]

In cast-iron made from zinciferous ores Percy found no zinc and Karsten but traces.[b] In smelting zinciferous iron ores in Virginia, green zinc flames escape for days at a time from the tap-hole and from the cinder-notch. Metallic zinc escapes through the cracks in the hearth,[c] and here as well as in smelting zinc residues for spiegeleisen (Franklinite) at Newark,[d] N. J., pieces of zinc sometimes float on both slag and iron as they run from the furnace, burning with a green flame and leaving deposits of zinc oxide. Occasionally, at Newark, after about a ton of cadmia has passed through the furnace, the "cast" is covered with zinc oxide, and the casting-house is filled with zinc fume: yet after removing the crust of sand and zinc oxide no zinc can be found in the cast-iron[d] on which zinc has been seen burning, and among many analyses of the slag I learn of but one which shows zinc. An old analysis of New Jersey spiegeleisen (1860±) gives 0·3% of zinc:[e] this is probably an error: it is said that both sampling and analysis were formerly improperly conducted.

As metallic zinc volatalizes far below the temperature at which iron and slag escape from the blast-furnace, its floating and burning on the cast-iron at first suggests that a zinc-iron alloy forms in the furnace, somewhat as in Parry's experiment, owing to the pressure of the zinc vapor, but decomposes and evolves its zinc when the pressure falls on its escape from the furnace. But the true explanation doubtless is that the metallic zinc, volatilized within the furnace, in escaping through the walls condenses in the damp clay stoppings of tap-hole and cinder-notch[f]: indeed, metallic zinc will often drip out when these stoppings are picked at, and in one case it is reported to have collected in a little pool beneath the tap-hole, and to have boiled furiously when the cast-iron ran upon it, burning the men.[d] A little of this condensed metallic zinc, picked up by the cast-iron or slag, would naturally float and burn as described.

Zinc added by G. H. Billings to pure molten ingot iron volatilized till but traces remained: the resulting ingot was slightly redshort,[g] perhaps owing to lack of manganese.

Zinc appears to render iron brittle at a red heat.[h] Thus a piece of tough galvanized iron wire was heated to redness so quickly that the coating of zinc melted and apparently penetrated into the interior of the metal instead of volatilizing. On attempting to bend it while hot it readily broke off short, exhibiting a uniform blue-gray fracture —as though the zinc had penetrated into the interior of the iron. When again cooled it became tough, and, on reheating it long enough to completely volatilize the zinc, its hot-shortness ceased.[i] It is stated that iron wire in molten zinc will often break off short, though the part outside the bath remains tough.

[a] Journ. Iron and St. Inst., 1874, I., p. 96.
[b] Percy, loc. cit.
[c] H. Firmstone, Trans. Am. Inst. Mining Engineers, VII., p. 93, 1879.
[d] Geo. C. Stone, private communications, July 25-28, 1887.
[e] Kerl, Grundriss der Eisenhüttenkunde. p. 42.
[f] H. Firmstone, private communication, July 29, 1887.
[g] Trans. Am. Inst. Mining Engrs., V., p. 454, 1877.
[h] Kerl, Grundriss der Eisenhüttenkunde, p. 24.
[i] W. H. Johnson, Proc. Royal Society, XXIII., p. 172, 1875.

Ledebur[j] has verified the observation that molten gray cast-iron becomes hard and inclined to whiteness if zinc be immersed in it, though little if any zinc is retained. This is possibly due to the expulsion of silicon.

The consideration of sterro-metal, a brass with 2 to 4% of iron, belongs rather to the metallurgy of copper than of steel.

B. Tin and Iron unite readily, as the firm union effected in making tin-plate shows, and in all proportions, forming apparently homogeneous alloys: but tin, or more probably a highly stanniferous alloy, liquates when alloys containing more than about 35% of tin are heated to or slightly above the melting point of this metal, till the more or less definite alloy Fe_4Sn holding about 35% of tin remains.[k]

Luckily tin occurs but very rarely in iron ores, for it destroys the ductility and forgeableness of iron. Some think it even more deleterious, weight for weight, than phosphorus. About 0·52% of tin, added to the charge in the puddling furnace according to Sterling's patent, caused copious white fumes and rendered the iron, which also emitted white fumes, extremely difficult to forge and weld.[k] Karsten[k] found that ·19% of tin made charcoal weld iron very brittle at a strong (*i. e.* welding?) heat, and extremely cold-short: Billings[l] found that ·73% of it rendered a very tough ingot iron decidedly cold-short, and so hot-short that at a white heat it flew under the hammer into particles so minute as to scintillate. Cast-iron melted with 2 to 5% of tin is reported as very hard and fragile; with 5% producing a bell of pretty good tone: with 9·09% as fusible, extremely fluid, non-rusting, whiter than cast-iron, acquiring a beautiful polish and having as good a tone as bell-metal.[m] The tin-iron alloys thus interest the iron founder more than the steel maker. Descriptions of a few better known alloys are here condensed.

Table 36.—Tin Iron Alloys.

			% Tin.	
1.	Nöllner		a 80 Sc	
2.	Deville and Caron		a 67·8c	
3.	Berthier		a 50·	Grayish white, very brittle, fracture granular.
4.	Berthier, Percy		a 35·1	Brittle pulverizable, magnetic.
5.	Hervé		0·9	Hard and brittle, slightly granular.
6.	G. H. Billings		b 0·73	Very cold-short, extremely red and white short.
7.	Karsten		a 0·19	Very tender at strong heat, difficult weldable, extremely cold short.
8.		Calculated composition.	a 90·9	Apparently uniform: very malleable.
9.			a 76·9	Pretty homogeneous, semi-malleable.
10.	Rinman		a 9 09	Very hard, brittle, dense: rust-proof, fusible, very fluid, can be highly polished.
11.	Percy		a 5·	A bell of this alloy had a pretty good tone.
			a 2· to 5·	Very hard, fragile, low tenacity.

a Percy, Iron and Steel, p. 160. b Billings, Trans. Am. Inst. Mining Engrs., V., p. 450. c Calculated composition.

C. Iron and Lead.—It is apparently possible but extremely difficult to alloy these metals, and no valuable properties have been noted in their alloys. I know of no successful attempt to alloy them directly. By reducing litharge with an excess of pure iron at a very high temperature Karsten obtained an iron containing on an average 2·06% of lead: Biewend obtained an iron containing 3·24% of lead by heating a slag rich in lead and iron in a brasqued crucible: beneath an iron blast-furnace a crystallized alloy containing 88·76% of lead and 11·14% of iron has been found. The wrought-iron ladles used in Pattinsonizing became eventually permeated with lead.[n]

(TO BE CONTINUED.)

[j] Loc. cit. Cf. Parry's experiment above.
[k] Percy, Iron and Steel, p. 161.
[l] Trans. Am. Inst. Min. Engrs., V., p. 450, 1877.
[n] Percy, Iron and Steel, p. 168.
Correction.—Page 260, first column, 13th line from bottom, *for* 17 *read* 7.

PERSONALS.

Mr. F. G. Corning, mining engineer, leaves for California next week on professional business.

Mr. W. H. Brinckerhoff, C.E., has joined the editorial staff of the *Engineering and Building Record*, of this city.

Mr. Otto Pfordte, mining engineer, has received an appointment with the Copper Queen Mining Company, of Bisbee, Arizona.

Mr. Frank M. Taylor, of Messrs. Taylor & Brunton, mining engineers, is now in Nevada on professional business for English capitalists.

Mr. M. C. Vincent, who has just examined the property of the Harney Peak Tin Mining Company, of Dakota, returned to England this week.

Mr. Henry Bratnober, superintendent of the mines of the Montana Company, Limited, Montana, has filed his resignation with the company.

Our excellent contemporary, the *Sanitary Engineer*, of this city, has changed its name, and will be known hereafter as the *Engineering and Building Record*. The old name will be retained as a sub-title.

Mr. John Robson, Provincial Secretary and Minister of Mines of British Columbia, is now in Ottawa, Ont. The British Columbia government is anxious to secure a speedy determination of the boundary lines between Alaska and Province.

Mr. E. H. Walker, for many years statistician of the New York Produce Exchange, has joined the editorial staff of Bradstreet's, the well-known commercial and financial newspaper published in New York, to which he will give his exclusive services.

Mr. Fred. H. Moore, of the firm of Brinker, Moore & Co., of Buffalo, N. Y., died on the 7th inst., aged 34 years. Mr. Moore had been in the coal business since his school days with Messrs. Dakin & Co., the Lehigh Valley Coal Company and others, previous to the formation of the firm named.

Mr. J. H. Collins, F.G.S., chemical and mining engineer, of London, England, the well-known author of many useful little books on practical metallurgy, chemistry and geology, has passed through this city on his way to British Columbia, whither he has gone on professional business. His address while there will be care of W. Prague, Esq., J. P., Yale, until the 14th of November, after which, and until further notice, his letters should be sent to the office of THE ENGINEERING AND MINING JOURNAL.

FURNACE, MILL, AND FACTORY.

The Bethlehem Iron Company, Bethlehem, Pa., has adopted oil fuel, under the Archer patents, for their reheating furnaces.

Negotiations for the sale of the Shelby Iron-Works, in Alabama, to capitalists interested in the Woodstock Iron Company, of Anniston, have been discontinued. It is reported that the price asked for the property was considered too high by the intending purchasers

The Fort Pitt Carbon Iron Co., Pittsburg, Pa., has just erected a new squeezer and train of muck rolls, to roll the iron made by the direct process of Dr. Eames. This company is more extensively engaged in making iron from the raw ore than any other company in this country.

The New York Iron Roofing and Corrugating Company, of New York, who have erected large works in Jersey City, report that they are doing a large business, far in excess of their expectations, in both their iron roofing and corrugating and Obelisk paint departments.

The furnace of the Walker Coal and Iron Company, at Rising Fawn, Ala., has blown out. The furnace has been run almost steadily for several years, and its record has been an exceptionally good one. It will now undergo thorough repair, and its capacity may be slightly increased.

The Northern Alabama Furnace, Foundry and Land Company has been organized, with a capital stock of $1,000,000, with the following officers: Dr. J. S. Lawton, Atlanta, Ga., President, and J. H. Field, Columbus, Miss., General Manager. The principal office is to be at Florence, Ala. The company has contracted to build three 150 ton furnaces. Work is to begin at once.

A meeting of creditors of the Steel Company, of Canada, was recently held in Halifax, N. S., and a report was presented concerning a provisional arrangement made by A. S. McClelland, the liquidator of the company's estate, with the Londonderry Iron Company. The intention is to sell out the mine, and thus settle up the business at once. The meeting of creditors to settle the matter is announced to be held in London on November 2d.

The Burlington Rolling-Mills, Burlington, Ia., which have been closed for over a year, have been rechartered under the name of the Iowa Rolling-Mill, with a capital of $70,000, and passed into the chief control of three capitalists from Youngstown, Ohio. The officers of the new company are: Theo. Guelich, President; J. W. Price, Vice-President; J. T. Remey, Treasurer; E. M. Wilson, Secretary; M. C. Williams, Superintendent. The mill is about to start up to turn out merchant iron.

The Linden Steel Company, of Pittsburg, Pa., has used the aluminum alloy of iron to free their ingots of pipes and blow-holes, and their success has been sufficient to induce them to experiment further, but not enough to say that it frees the ingots of blow-holes and pipes entirely. Their experiments have been mainly in another direction than castings, believing and finding that the alloy not only has its effect on the gas pores but also on the physical properties of the ingot—both favorable, but not so much so as to induce them to use or advise its use regularly. They propose to continue these experiments.

Dr. Gatling, of Hartford, Conn., has arranged to build a foundry in Philadelphia. The proposed test of the new Gatling gun—new by virtue of a feeder which enables it to fire 1200 rifle balls per minute with the precision, it is claimed, of a target rifle—will be viewed by ordnance officers of the United States Army. About the same time private tests will be made of the new gun in France, when, for the first time, the new copper cartridges, of whose manufacture France holds the secret, will be tried and adapted to the Gatling gun, for which they are made. One such improved gun is claimed to be equal to a regiment of infantry, and rumors are in the air of lively competition between France and Germany for the first orders from the new feeder factory.

The purchasers of the Scottdale Iron-Works, at Everson, Pa., to the sale of which we referred to in our issue of the 1st inst., are considering a scheme whereby the mill may be turned into a factory for the production of cut wire and horseshoe nails. In order to make the change it will require an outlay of about $75,000. This is based upon the assumption that the plate mill of recent construction can be readily changed to a nail plate mill. The Coyne process of nail making will be used, as it dispenses with feeders and under it nailers will work for a third less than ordinary nailers' wages. Indeed, the nailers are reported to have agreed to this arrangement, if the nail mill is concluded upon. The new mill will have a capacity of at least 3,000 kegs of nails per day. It is said that with two men and four machines 10,000 pounds of ordinary nails will be turned out daily, while under the old plan five men and four machines only produced 7,000 pounds.

The detailed report of Gen. Merwin, trustee of the insolvent estate of E. S. Wheeler, of New Haven, Conn., to the failure of whom we refer in our issue of September 10th, places the total liabilities at $1,319,775, of which $68,330 is for letters of credit for the bankrupt New Haven Wire Company (of which Wheeler was the principal owner), indorsed by E. S. Wheeler & Co., and between $300,000 and $400 000 of domestic paper of the wire company, also indorsed by E. S. Wheeler & Co. The trustee does not expect to realize more than 15 per cent on the wire company paper. Besides the above mentioned liabilities, there are $50,000 said to be covered by good collateral and $60,000 indorsed notes counted as good paper. The trustee shrinks the assets to $151,640, of which he says: "Supposed to be available sometime; whether they will increase or diminish time and the law will determine." Of the assets the trustee rates 1195 shares New Haven Rolling Mill (995 shares hypothecated) at $1000; 1349 shares New Haven Wire Company, par $1000, 814 shares hypothecated (as worthless); bills receivable, $24,811 (worthless); book accounts, $10,047 (worthless); book accounts reported good, $75,000 ($20,000 under attachment); good bills receivable, $2456 ($1545 replevined); stock on hand, $40,000 ($3,000 attached). Articles of association of the E. S. Wheeler Company have been subscribed to at New Haven, Conn. The principal stockholders are Pierce N. Welch, trustee, and Ella W. Wheeler. The capital stock of the corporation is $25,000, divided into 1000 shares of $25 each. The company has been organized to continue the business established by E. S. Wheeler. Pierce N. Welch holds 600 shares in trust for his sister, Mr. Wheeler's wife. Mr. Wheeler has been made manager of the new fund. C. S. Mersick & Company have purchased of General E. S. Merrin, the trustee, the entire stock of tin plates, iron, etc., belonging to the insolvent estate, and have sold a portion to the new company.

CONTRACTING NOTES.

Contracts Open will be found on page xix. New Contracts this week: No. 576, Bridge; No. 577, Iron Bridge; No. 578, Light-house; No. 579, Hose; No. 580, Sewer; No. 581, Pumping Engines; No. 582, Pipe for Works; No. 583, Electric Lighting; No. 584, Bridge; No. 585, Rails, Engines and Motors; No. 586, Water-Works.

B. L. Dulaney, Bristol, Tenn., is in the market for two 60 horse-power engines.

Messrs. Scovel & Irvin, of Nashville, Tenn., have contracted to build complete water-works for Bessemer, Ala.

L. J. Lawson, Greensboro, Ala., will contract for machinery for drilling artesian wells and for the sinking of wells.

LABOR AND WAGES.

A dispatch from Vincennes, Ind., says twenty-five hundred to three thousand miners are on a strike in Southern Indiana, and one thousand or more are out in the Davies County coal mines. They will not listen to any compromise, and the companies, it is stated, are equally determined. President Fisher, of the Miners' Federation, sent out a manifesto on the 13th inst. to the effect that wages have been forced below living rates, and they are going to force them up. He says: "The cost of production here is small compared with other mining districts. Mining is from 45 to 60 cents per ton, a day's labor from 90 cents to $1 per day, and the men paid in most part out of the company's stores.

Press dispatches report that there is a growing feeling at Hazleton, Pa., that the strike of the mine laborers in the Lehigh region is nearing an end, and that the end will be a victory for the operators. This belief is founded on the fact that the men on strike have not received from the Knights of Labor organization the assistance that was promised them. When the order was given for them to lay down their tools and quit work the representatives of the organization told them they would each receive $1 a day while the strike continued. The men accepted the promise unhesitatingly and in good faith. Fifteen thousand men joined the strike, and if each one had been given the $1 a day promised the amount thus distributed by the Knights of Labor would, up to toe present time, foot up the total of $360,000. Instead of this, however, not $10,000 has been sent here and distributed, and many of the men and their families are beginning to suffer for want of the necessaries of life. The consequence is that much dissatisfaction exists among them, and it is believed that to-day most of them would return to work at the old wages if the operators would ask them to.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including October 5th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1887.	Tons. 1886.
Marquette, Marquette District	674,019	709,313
St. Ignace, " "	77 065	58,272
Escanaba, " "	721,952	497,111
" Menominee District	9.6,871	710,219
Ashland, Gogebic District	904,934	576,383
Two Harbors Minnesota Iron Company, Vermillion District	312,195	247,451
Total tons	3,627,036	2,798,749

SHIPMENTS OF IRON ORE, GOGEBIC DISTRICT.—Shipments of iron ore from Ashland, Wis., the mines of the Gogebic District, for the season, up to and including October 5th, are as follows:

	Tons.		Tons.
Anvil	4,581	Norrie	153.976
Ashland	132,784	Odanah	18,186
Aurora	95,853	Pabst	7,907
Bessemer	9,471	Palms	1,342
Brotherton	17,817	Pence	1,457
Colby North	56.950	Puritan	25,024
Colby South	135,811	Sunday Lake	10,759
Germania	41,768	Superior	20,232
Iron Chief	2,250	Sellwood	2,3 4
Iron King	39,216	Vaughn	2,101
Ironton	23,110	Trimble	15,288
Kakagon	40,741	South 15	2,582
Montreal	23,187	Parker	578
Nimikon	18,389	Total tons	904,934

The shipment shows an increase of 328,551 tons this year, as compared with the shipments made at the same time last year.

At the group of mining properties on the Gogebic Range, known as the Moore-Benjamin mines, last week, operations in a great measure were suspended and the majority of the men employed were discharged. General Manager R. A. Parker states that the suspension will be only temporary.

During the past summer the firm of Moore, Benjamin & Co. have been compelled to raise for their mines outside of the Aurora, over $500,000, for rail and lake freights and for the monthly pay-rolls and bills that have been met in the past. They now hold the notes of the furnace companies for the ore that has been delivered to them, and until these are paid it is deemed advisable to reduce expenditures.

The condition of the mines themselves is excellent and their financial standing on account of the summer's work entirely gratifying and satisfactory. There is to-day an actual net profit over every possible expense that has been incurred of very nearly $90,000, and this does not include any of the profits arising from the immense output of the Aurora. The mines are in a better condition to-day than for some time past, notably the Bessemer and Nimikon.

ALABAMA.

The contract has been awarded for the grading of the Warrior Coal Fields Railroad between Meridian, Miss., and Gainesville, Ala. This will insure the building of the entire line to its northern terminus at Decatur, Ala.

UNION OIL, GAS AND ASPHALT COMPANY.—This company, organized with a capital of $86,000, has purchased 860 acres of land. It is stated that a pocket of asphalt has been found on the surface, and indications of oil. Development-work will begin at once.

ARIZONA.

Thomas S. Bullock has obtained from Judge Donohue, of the Supreme Court, New York City, an attachment against the property, in New York State, of Frederick A. Tritle, of Prescott, Arizona, in a suit to recover $5000. Bullock makes affidavit that, July 7th, 1887, he loaned Tritle $10,000, taking as security Tritle's note for $5,000 and 48,000 shares of the United Verde Copper Company; that thereafter, in consequence of certain representations made by Tritle

he was induced to give him back the copper stock, and also to buy of him 10,000 shares of the Arizona Investment and Development Company. Having learned that the Arizona Investment and Development Company had its existence in the airy fancies of Mr. Tritle's brain, Mr. Bullock swears that he called upon him at the Gilsey House, in New York City, and demanded the return of his money and stock, but that the only satisfaction he got was the steadfast assurance of Tritle that he would "do" him out of both.

The United Verde Copper Company has also obtained an attachment against Tritle's property in a suit to recover $8500, which it claims Tritle owes it for some coke which he purchased of it, but did not pay for.

PIMA COUNTY—QUIJOTOA DISTRICT.

CROCKER MINING COMPANY.—The east cross-cut from the south lateral drift is still showing Devon vein matter, but from indications the next round will break into the country lying between the Crocker-Devon veins close to the intersection.

PEERLESS SILVER MINING COMPANY.—The pay strata of the north drift from the winze is looking firm and of good width. The formation on the east side of the vein is somewhat broken up by open seams and caves.

PINAL COUNTY.

SILVER KING MINING COMPANY.—The company has shut down ten stamps temporarily, and will not employ any new men until hoisting-works and other machinery has been placed in position at the North King shaft which will probably be about the beginning of next month.

YUMA COUNTY.

HAUCAVAR.—These copper mines, in the northeastern part of Yuma County, are soon to be operated, having been purchased some time since by St. Louis parties. It is said that the company contemplates the erection of four 30-ton furnaces.

CALIFORNIA.

AMADOR COUNTY.

AMADOR QUEEN MINING COMPANY.—The Supreme Court has affirmed the judgment of the lower court in the case of the Amador Queen Mining Company *vs.* William Dewitt, the action being to condemn the right of way through a tunnel under defendant's mining claim. Dewitt works a high ridge of land as a mining claim lying between Hunt's Gulch and Murphy's Gulch, in Amador County. The Amador Queen Mining Company owns a claim in Murphy's Gulch, and claims the right to construct a tunnel between that place and the company's quartz mill in Hunt' Gulch, without which tunnel it can not continue to develop its mine.

The case has been watched with interest by mining men, as it involves the question whether a right of way through private property can be used for purely private purposes by others than the owner. The decision of the lower court, which is affirmed by the Supreme Court's decision, was that the tunnel could not be constructed, as the United States patent under which Dewitt holds his claim can not be so construed as to mean that the right of way can be so used.

SIERRA COUNTY.

SIERRA BUTTES GOLD MINING COMPANY, LIMITED.—The upper mill of the Sierra Buttes mine, containing fifty stamps, was totally destroyed by fire on the night of the 5th inst. It has not yet been decided whether it will be rebuilt this winter.

COLORADO.

ARAPAHOE COUNTY.

The old Lyman Cole property, six miles northwest of Denver, embracing about 800 acres, was recently sold to a Kansas City syndicate. The land was bought for agricultural purposes, but is likely to go back to what it was first used for—mining. Gold was washed from its sands in abundance in the early days, and a dry-placer saving machine, lately patented, has been erected on the property and is now in operation, showing good results.

CHAFFEE COUNTY.

LADY MURPHY MINING COMPANY.—The management of this mine is running a tunnel to drain the mine. When this is completed the mine will be a steady producer.

MARY MURPHY MINING COMPANY.—The Mary Murphy mine still continues to be a large producer, the shipments being 100 tons a day. A drift being run on the vein in the seventh level shows 8 feet of ore.

MINETONK.—This mine, situated in Grizzly Gulch, was recently sold to Messrs. Webb & White, of St. Louis, for $40,000, and work will be started up. The present owners propose to develop this property extensively.

CUSTER COUNTY.

SECURITY MINING AND MILLING COMPANY.—The mill has consumed all the ore quarried this summer and has been shut down for the present. The *Mine, Stock and Rail* states that the shaft now being sunk is in the center of the place from which this ore came which dips into the hill, and it would require still more expensive stripping above, or equally expensive extraction of the ore on its dip with rather loose bodies of barren rock on top. The present shaft sinking will result either in underground mining or in the final abandonment of the work. With stripping so much ground the final margin of the ore thus mined, then concentrated, and then sold in concentrate, must be small. We share the managers' belief in the continuance and the improvement of this class of ore in depth if its course is properly followed. The closing of the mill demonstrates, however, that at present no sufficient supply can be furnished economically and profitably to the mill by continuing the stripping, and it will require considerable developments under ground ere the mine will again yield such or better material.

This the readers of THE ENGINEERING AND MINING JOURNAL will remember is what we told them long ago.

LAKE COUNTY.

We condense the following from the Denver *Mining Industry* and Leadville *Herald Democrat:*

ADAMS MINING COMPANY.—The machinery on the Adams shaft, on Carbonate Hill, has been moved to the discovery shaft of the Adams company's property on Yankee Hill, and this shaft is to be at once sunk to greater depth. The shaft is now down over 500 feet, and will probably have to go 100 to 150 feet farther to strike the desired zone. Very little ore is being produced at present. The mill building is completed, and the plant of concentrating machinery is rapidly being put in position.

DINERO MINING AND MILLING COMPANY.—We are officially advised that the new mill made its first run on ore last week with very promising results. The ore treated contained 20 ounces siver per ton, and a very large percentage of talc. The system of screening under water is a complete success, so far as concerns the talc, which is entirely broken up, and therefore does not interfere either with crushing or sizing. So far the slime table product is the best, carrying about 75 ounces silver, with tailings at 1¾ ounces silver on the average. The jig concentrates assay from 60 to 85 ounces silver, with tailings from 2 to 6 ounces, averaging about 4½ ounces per ton. As the machinery is driven by water-power, the mill should be quite profitable.

DUNKIN MINING COMPANY.—From 25 to 30 tons of ore are produced daily and sent to the American Mining and Smelting Company under contract. The production of first class ore has been somewhat curtailed of late, owing to an influx of water cutting off access to the stope off of raise No. 3, where the major portion of the best ore was being excavated. A new strike has just been made between No. 1 and No. 4 raises, and near the No. 4 raise, and the ore now exposed measures two feet in thickness, averages of the entire breast yielding the handsome return of 822 ounces silver and 52 per cent lead. The bodies of iron ore in the mine still show as well or even better than when first opened up.

GREAT HOPES CONSOLIDATED MINING COMPANY.—The lessees of the south shaft of the Hibernia, on this property, have shipped three loads of fine looking ore. Three leases are being worked on the old Amie property. A large amount of silver-iron ore has been shipped during the summer. A great deal of the ore, while first-class iron, is too low in silver to pay.

IRON SILVER MINING COMPANY.—The W. A. lode of this company, covering about an acre of ground on the west side of Iron Hill, below the fault, now discloses $300,000 worth of ore. The mineral is a portion of the iron mine ore chute opened by the McKeon and Houghton workings.

LITTLE CHIEF MINING COMPANY.—The old dumps of this mine are still being worked over, and the material concentrated by hand jigs.

MIKE AND STARR.—This mine, on Breece Hill, has been started up again. The property is opened by a shaft over 400 feet in depth, disclosing a large body of sulphide ore. The mineral varies from that produced by most Leadville mines, in the fact that it carries a considerable percentage of copper, in the form of pyrites. It has shipped considerable ore in the past, but so far has returned no profit.

RED HOOK.—The consummation of the sale of this mine in Colorado Gulch, seven miles west of Leadville, to St. Louis parties is reported. It is stated that the second payment has been made, and the remainder of the $40,000 purchase money is to be handed over shortly.

VIRGINIUS.—This property has been purchased by St. Louis parties, who intend to push development work on the property. Mr. John B. Henslee has been appointed manager of the property.

SAN MIGUEL COUNTY.

GOLDEN CHICKEN MINING COMPANY.—The company has contracted to have a 20-stamp mill erected, to be completed in thirty days. Since the recent strike, made some time ago, the property has been showing up well.

DAKOTA.

LAWRENCE COUNTY.

IRON HILL MINING COMPANY.—Drifting to connect the Home Run with the main shaft has been commenced from the 200 foot level of the latter. It is proposed also to shortly begin drifting from the Home Run, although in which direction, three being available, has not yet been decided. The work of sinking will, however, be continued.

PENNINGTON COUNTY.

HARNEY PEAK TIN MINING COMPANY.—According to local papers, this company has bonded a group, consisting of the Naiad Queen, Brown King, Deacon Wright, and Mugwump tin locations, situated on Spring Creek, at a place called Niggerville. The consideration was $20,000, the bond expiring on the first day of May, 1888. Also the Tin King group, consisting of four locations, viz.: The Tin King No. 1, 2 and 3, and the Blackbird, for $10,000, the bond to run until May 1st. The group is situated about three fourths of a mile east of the Niggerville group above referred to.

GEORGIA.

Mr. J. H. Vreeland is opening up different mining enterprises in Paulding and adjoining counties, and will use considerable machinery.

ROCKDALE COUNTY.

Efforts are being made to organize a company at Conyers, with a capital of $300,000, for the purpose of opening up granite quarries within three to six miles of the city. One of the objects of the company will be to build a railroad line from Conyers to the quarries.

IDAHO.

The annual report of the Governor of this State shows that the production of gold, silver and lead in the territory during the year ended September 30, 1887, is estimated by the United States Assay Office at Boise City as follows: Gold, $2,417,429; silver, $4,633,160; lead, $2,195,000, making the total mineral production of the territory for the year $9,245,589. The Governor recommends that the Alien Land act be so amended as not to apply to mineral lands in the territories.

ALTURAS COUNTY.

JUNCTION MINING COMPANY.—The company will let a contract to do 250 feet of drifting on the ledge from the bottom of the shaft. While this drift is running machinery will be purchased and set up over the shaft, and as soon as it is in position the company will resume sinking to the 500-foot level, opening levels every 100 feet.

INDIANA.

The opening up of the Vandalia south branch from Brazil to Saline City, a distance of twenty miles, by the Evansville & Indianapolis Railroad, is of much significance in the development of the coal industry of the State. This is due, of course, to its importance as a connecting link. Saline City is a station on the Evansville & Indianapolis road, while Brazil is the southern terminus of the Chicago & Indiana coal road. The two systems together constitute a through line from the lakes to the Gulf, through the Louisville & Nashville, or by river at Evansville. The roads traverse the coal-fields of the State for 180 miles, their entire length.

KANSAS.

Rock salt was struck at South Hutchinson at a depth of 470 feet, and veins varying in thickness from 7 to 40 feet, separated by a thin strata of shale, were found. At a depth of 665 feet a vein was struck which, up to the 12th inst., had been penetrated to a depth of 35 feet, without the drill reaching through. An official analysis of the product, it is reported, shows it to be over 96 per cent pure.

KENTUCKY.

BREATHITT COUNTY.

A syndicate of Springfield and Eastern capitalists has organized a company with a capital stock of $3,000,000, and is said to have purchased 68,000 acres of coal land in Breathitt County. Work will begin at once to open the mines and build railroads.

MAINE.

HANCOCK COUNTY.

ROZIER.—The waste ore on the dumps of this mine at Cape Rozier, amounting to several hundred tons, has been bought by F. L. Bartlett, and is being shipped to his smelting-works at Portland. It is stated that Mr. Bartlett has made offers both to lease and buy the mine, but thus far has failed in obtaining any title whereby he can work it.

MEXICO.

CONCEPCION.—Col. James E. Blythe and party, of St. Louis, have returned from Mexico, whither they had gone to inspect the Concepcion mine in Tlalpujahua. This visit was only the first of semi-annual visits which the company has decided to institute. They report that the ore which is now being worked is found at a depth of 175 feet, on the first level, but work is being carried on 114 feet lower down, and there the grade of the ore is much higher. The work of draining the water from the lowest workings is successful, and the required steam power is all supplied from the main boilers. Over 300 feet of good stoping ground has been opened out, and the cross-cut from the lower workings to the incline shaft will soon be completed.

ST. LOUIS & MEXICAN INVESTMENT AND IMPROVEMENT COMPANY.—The stockholders of this company have been called upon to subscribe for the remaining $20,000 of the bonds issued some time ago, as mentioned in our issue of July 16th, for the purpose of raising funds to enable work to be carried on at the mine. Of the $100,000 issued, only $30,000 was subscribed for, while it was intended to secure subscriptions to half the issue, the remaining half to be put out only in case of necessity.

MICHIGAN.

COPPER MINES.

The following statement gives the product in "Mineral," carrying about 75 per cent copper, of the mines mentioned for September and for nine months of 1887, and a comparison with the outputs of the same mines in the two preceding years:

	—September—			—Jan. 1 to Sept. 30—		
	1887.	1886.	1885.	1887.	1886.	1885.
Mines.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Calumet & Hecla.	2,016	2,891	2,557	21,823	24,715	22,778
Tamarack	500	211	....	3,236	1,822	.....
Atlantic	217	214	214	1,988	2,370	2,279
Franklin	200	375	351	†1,815	1,766	1,824
Osceola	190	191	*....	1,793	1,837	1,695
Quincy	186	216	202	1,517	1,520	859
Huron	125	105	115	589	968	1,000
Total seven mines	3,424	4,203	3,439	32,761	34,998	30,465

* Mill shut down. † One month estimated.

Atlantic Mining Company.—The output for the last month shows an improvement over previous months.

Calumet & Hecla Mining Company.—The product increased from 1340 tons in August to 2016 tons in September. An air-compressor at the mine burst on the 8th inst., causing a loss of about $25,000. Work in the mine will not be interfered with.

Huron Copper Mining Company.—The September output is forty-nine tons larger than the August product and is the best September output in the history of the mine.

Quincy Mining Company.—The effects of the accident to the engine shaft brought decreased outputs for August and September, but October is expected to show fully as much mineral produced as in the months previous to the disaster.

GOLD MINES.

Michigan Gold Company.—Sinking the two shafts on the Gingrass tract continues, and last week the veins in the bottom were but a few inches apart, whereas on surface they were eight feet. Some fine looking quartz has been mined, and assays made of these have given good results. Another vein of quartz has been found upon the property, lying to the north of all the others and being fully as strong, having a width of from three to six feet, the quartz being of a similar nature to that found in the main lode.

IRON MINES.

Penn Iron Company.—The company has leased the Curry mine, which has been inactive for some time past, and will at once institute active mining work there. The fee of this property is vested in the Canal Company, and the lease of the company which formerly operated the mine was forfeited by non-conformity with its provisions.

MONTANA.

The Governor of Montana Territory, in his annual report, states that a conservative estimate of the yield of the mines in gold, silver, lead, and copper for the year is $26,000,000. The forests of Montana are on the decrease, as forest fires and the demand of mines, fencing, and railroad building are rapidly sweeping them away. The number of miles of railroad built and put in operation in the territory in the year is 626. In conclusion, the report says that Montana's interests have been greatly crippled and her progress much retarded on account of the alien land law. "The law," it says, "so far as it has or will prevent aliens from grasping and holding great and extensive areas of land, may be unobjectionable, but the provisions under which foreign capital is kept from investment in and for the development of our mines are a great weight and hindrance to our people."

BEAVERHEAD COUNTY.

Hecla Consolidated Mining Company.—The company has again started up, and is now running full blast.

DEER LODGE COUNTY.

Bimetallic Mining Company.—A strike of an 8-foot vein of ore, which runs from 200 to 400 ounces, is reported. The strike was made at a depth of 275 feet below the Granite Mountain's No. 6, and 100 feet below No. 7 level.

Black Pine Mining Company.—A meeting was held at Butte last week for the purpose of devising means for raising funds to settle the debts of the company for which its personal property has been attached, as already mentioned in our issue September 24th, and suit commenced. These claims aggregate about $28,000, of which amount some $15,000 is for labor and supplies, and the balance, almost $13,000, for overdraft at the First National Bank at Butte. As an offset against the latter amount, there is a bullion shipment of some three or four thousand dollars' value yet to hear from. It is stated that about $40,000 would be needed to pay off the indebtedness and leave a sufficient working capital to go ahead with. A committee consisting of Judge Barret, G. W. Stapleton, J. E. Rickards, John Gillie, and C. W. Goodale was appointed to arrange for a loan of this amount, and report at an adjourned meeting. The proposition is to mortgage the mill (which cost $38,000) and the company's twenty-one claims to raise the money.

West Granite Mining Company.—Reports state that two feet of good ore had been struck on the 400-foot level.

GALLATIN COUNTY.

Spangler.—Helena and Butte capitalists have secured control of these coal mines, which are situated one half mile from Livingston. A company has been formed and will erect coke-ovens. The coal is said to be of excellent coking quality. The production of coke from coal found in that vicinity by the ovens erected by Governor Hauser, one mile west of Livington, is entirely successful.

LEWIS & CLARKE COUNTY.

Montana Company, Limited.—A meeting was held in London last week for the purpose of deciding the question of dividing the existing £2 shares into two shares of £1 each. Official advices to us state that the production for September amounted to $180,100, the working expenses for the month were $57,000.

SILVER BOW COUNTY.

Alice Gold and Silver Mining Company.—The mines and mills were closed down on the 1st inst., and operations will not be resumed until the freight rate on salt has been reduced by the railroad company.

Anaconda Mining Company.—The shaft which is now down 1000 feet will be sunk to a depth of 2000 feet. At present from sixty to seventy-five cars of ore, containing from twenty to twenty-five tons each, are shipped daily to the smelter from the Anaconda and St. Lawrence mines.

Apex Mining Company.—The prospecting shafts at various points on the three claims show from 4 to 7 feet of a good grade of milling ore, carrying both gold and silver. Sinking a vertical working shaft has been commenced. The machinery is suitable for going down 600 or 700 feet if necessary. The new mill, to which we referred in our issue of September 17th, will be constructed at once, the contract calling for its completion by the 1st of February. Fraser & Chalmers will furnish the machinery.

Lexington Mining Company.—Official advices to us report the production for September at $10,360 in gold and $64,865 in silver, making a total of $75,225.

NEBRASKA.

DOUGLASS COUNTY.

Omaha & Grant Smelting and Refining Company.—The Omaha works of this company are now receiving a great portion of the ore from the North and West formerly shipped to the Denver establishment, and are now reducing about 3500 to 4000 tons a month. The Denver *Mining Industry* says that it is calculated that the Omaha works will reduce 50,000 tons of ore this year. A great portion of the ore contains an excessive quantity of antimony, which is now being utilized and converted into white metal, which finds a ready market. The establishment is also producing fifty barrels of blue vitriol a day, and in the near future other by-products will probably be manufactured.

NEVADA.

ELKO COUNTY.

East Grand Prize Silver Mining Company.—This company has been organized, with a capital stock of $10,000,000, to work mineral properties in the Tuscarora District. The directors are Noah W. Scudder, of Petaluma; Asa H. Truman, Edward F. Reed, Alfred D. Taylor and Robert P. Scott.

Seal of Nevada Mining Company.—This company has been organized, with a capital stock of $5,000,000, to develop its claim at Tuscarora. The directors are Charles N. Fox, M. H. Bedolfe, W. R. Townsend, Lyman Bridges and William Hendrickson.

EUREKA COUNTY.

Eureka Consolidated Mining Company.—The production for September amounted to $59,665.29. During August and September 250 tons of lead were produced.

LANDER COUNTY.

Manhattan Mining Company.—The company's property at Austin has been attached. The *Silver State* states that suits upon suits were instituted against the company by creditors, one being by the Nevada Central Railway for heavy freight bills. The manager, L. J. Hanchett, is East, and the mine has been placed in charge of a new superintendent. Last spring the mine was purchased by the present company, the price paid being reported at over a million dollars. Immediately afterward an assessment of fifty cents per share was levied upon the capital stock of the company, and concentrating machinery was erected to reduce low-grade ores, of which there was said to be large quantities in the old dumps. It appears, however, that it did not pay, and the wages of miners have not been paid for some time.

STOREY COUNTY—COMSTOCK LODE.

The following is condensed from the Virginia City *Chronicle*:

Alpha Consolidated Mill and Mining Company.—This company has been organized in California with a capital stock of $10,000,000. Should the recent ore developement on the Alpha, 222 level, prove of sufficient importance to justify it, the company proposes erecting a stamp-mill near the shaft to be operated by water-power on the same principle adopted at the Consolidated California & Virginia. The quartz belt in which the six-foot streak of high grade ore was developed, is of great breadth, and is known to extend downward to the 900 level, where it was developed in drifting from the Imperial incline. The directors of the new company are Charles E. Elliot, C. D. Olney, Max Popper, N. D. Anderson and L. Wheeler.

Consolidated California and Virginia Mining Company.—During the week ended the 1st inst., 1017 tons of ore were shipped to the Morgan mill, and 706 tons to the California mill. The average assay value of all the ore worked at both the above mills during the week, according to battery samples, was $27.98.

Iowa Mining Company.—A number of labor liens have been filed against this company.

Yellow Jacket Mining Company.—A force of 160 miners has been added to secure the extraction of ore from the old stopes between the 900 and 1300 levels. The first shipment was made on the 1st inst.

NEW MEXICO

GRANT COUNTY.

Some Baltimore parties are going to put up a 20-stamp mill at Shakespeare, and if sufficient water can be obtained, 30 stamps will be put in. Fraser & Chalmers will furnish the machinery. The most serious drawback that will have to be met is the water question, but the Southern Pacific Company, after the expenditure of large amounts of money and many months time, succeeded in getting a good water supply.

Bremen Mining Company.—Work is going on steadily at this mine, and there is now on hand ore enough to keep the mill running for about a month. The ore now on hand has been taken from the dumps, but development work is being carried on in new ground. There are now thirty men at work, and a Rand drill is in operation, which is doing excellent work. The mill will be started up shortly.

Pacific.—Messrs. Bell & Stephens, of Pinos Altos, have purchased this mine at Pinos Altos for $20,500. This mine, it is said, was one of the first mines which attracted attention to that camp, and for many years was a regular producer, during which time it probably turned out more than any other mine in Southern New Mexico. Like all the other mines of that camp, however, it was shut down after the free-milling ore near the surface had been worked out and the base metal reached. There is still plenty of free-milling ore in the Pacific, but it was not generally encountered in sufficient quantities to make the mine pay in the crude way in which it was necessary to treat the ore years ago. The Pacific has and does still produce ore that contains more free gold than quartz; but the great wealth of the property is contained in its base ores, which the purchasers are prepared to treat successfully.

SIERRA COUNTY.

Templar Mining Company.—The Pride of the West mine has been purchased by this company, of Kansas City, for $30,000. The mine is situated in the Percha mining district, near Kingston, and is the third extension north on the Keystone lode or vien, the first location on the fissure being the Keystone, then the Virginian, Templar and Pride of the West. The vein matter, ore and gangue in the Pride of the West is identical with that of the Templar.

NEW JERSEY.

Messrs. Cooper, Hewitt & Company are carrying on mining operations in northern New Jersey now just as they always have done, but they have not, as had been reported, reopened other mines in this State.

NEW YORK.

TOMPKINS COUNTY.

Rock-salt was struck on the 7th inst. in the test well at Ithaca at a depth of 2270 feet. The salt is clear and pure, and according to official advices is over fifty feet thick. The well is to be put down 1000 feet further in search of oil and gas.

NORTH CAROLINA.

MONTGOMERY COUNTY.

Sam Christian Gold Hydraulic Company.—Mr. E. B. C. Hambley, the resident managing director of this company, has returned from London, and work will be commenced at once, the first object being to ascertain the fall of the River Yadkin from Salisbury to Swift Island, a distance of some 40 miles, with a view of determining the method of supplying the mine with a sufficient head of water. If it be found possible to bring the water by means of a ditch it will be done. Should this, however, prove not practicable the water can be raised at Swift Island, where a sufficient water power can be obtained. It is the object of the company to acquire 2000 inches (34,000,000 gallons per 24 hours).

PENNSYLVANIA.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to October 8th:

	1887. Gallons	1886. Gallons
From Boston	3,298,817	4,111,342
Philadelphia	125,797,735	114,790,877
Baltimore	6,496,152	12,581,444
Perth Amboy	12,929,493	3,998,017
New York	288,160,742	303,342,109
Total exports	436,682,939	438,823,779

The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of September, 1887, and during the nine months ended September 30th, 1887, as compared with similar exports during the corresponding periods of the preceding year, as follows: September, 1887, $4,013,189; August, 1886, $4,365,2.3, nine months ended September, 30th, $33,349,547; nine months ended September 30th, 1886, $35,546,213. These exports comprise about 99 per cent of the total exports in mineral oils.

NATURAL GAS.

The Royal Gas Company and the Washington Natural Gas Company have been consolidated. The Royal has the lease of several thousand acres of the best gas lands in the Hickory District of Washington County. It has pipe lines laid down from Hickory to Steubenville and Mingo, Ohio, and Wellsburg, W. Va. It has an abundance of gas. The Washington Company has two lines, six and eight-inch, respectively, into Pittsburg from the Washington County field. It owns the McGugin well and also two or three other wells in the same locality, and has quite a large block of leases. Its lines only penetrate Pittsburg as far as Painter's mill on the South Side, as its ability to furnish gas has been limited to this point. It is the intention of the consolidated company to extend the lines through the streets of the South Side, and also to throw a line across the Monongahela River and ramify the streets of Pittsburg city.

Baden Natural Gas Company.—Press dispatches report that this company has signed the papers transferring its franchises, 5000 acres of territory and 150 miles of gas mains to a syndicate of Philadelphia capitalists.

BRIDGEWATER GAS COMPANY.—This company is energetically pushing the work of connecting its wells with the distributive system in Youngstown, O., and mains are being laid at the rate of a mile a day. On y about 15 miles of the 38 miles of pipe line remain to be laid, and the company will be furnishing gas to consumers before November 1st.

CHARTIERS VALLEY GAS COMPANY.—The company has completed its new line of large pipe from its wells to Pittsburg, and is now prepared to meet all demands that can possibly be made upon it for gas.

MANUFACTURERS' NATURAL GAS COMPANY.—A meeting will be held by this company on the 18th inst. to consider a proposition to increase the capital stock. If the stock is increased, it is intended to lay another line from the Washington County field to Pittsburg, and to extend its line in other streets in that city.

SOUTH CAROLINA.

AIKEN COUNTY.

CRAIG KAOLIN COMPANY.—This company, to the organization of which we referred in our issue of June 25th, decided to increase its capital stock from $15,000 to $50,000. The reason given is that in addition to the clay beds previously discovered, the company has discovered a bed of greater extent and of fine quality, white and free from grit. Shipments will shortly begin.

TENNESSEE.

EMERY COAL AND RAILROAD COMPANY.—The projectors of this company, residents of Chattanooga, have for several years been buying mineral and coal lands in Morgan, Scott, Cumberland and Hamilton counties, Tennesseee. It is stated that they have just closed a purchase of 100,000 acres of land, besides $150,000 worth of property in Chattanooga, and have applied for a charter with a capital of $1,000,000.

TEXAS.

PRESIDIO COUNTY.

PRESIDIO MINING COMPANY.—The suit of John Bullis vs. the Presidio Mining Company is now pending in the courts at Marfa, where it has been for three years. The plaintiff sues the company for the possession of one fourth of a mine which lies in the Chenali Mountains, thirty miles south of Marfa, and which belongs to the above company. The mine in dispute is idle, but adjoining claims, also belonging to the company, are worked. A ten-stamp mill is on the property. It was expected that the suit would be decided at the present term of court, but the wife of John Bullis, the plaintiff, recently died, and the suit had to be continued to make her heirs parties to the suit. As soon as the matter is decided the company will build a smelter.

WISE COUNTY.

NEW WEST TEXAS MINING AND EXPLORING COMPANY.—This company, which has a capital of $500,000, has been organized for the purpose of developing and working mineral properties near Decatur.

UTAH.

The receipts of bullion (excluding all ores) in Salt Lake City, for the nine months of 1887, have amounted to $3,572,266.87.

WEST END MINING COMPANY.—This company has been organized in Salt Lake City, with a capital stock of $1,500,000, shares $10 each. The company owns the following properties: The Sun Light, the Miner's Dream, the Lucky John, the Aspos Extension, situated in Big Cottonwood Mining District, Salt Lake County, at the head of Big Cottonwood Canyon; the company also owns an undivided two thirds of the Aspos mining claim. The principal office will be at Park City, situated in Uintah Mining District, Summit County. The trustees are Andrew Loudin, Gus Norquist, Frederick C. Thompson, Truman Schenck, Childs Mantor, John L. Street and Charles C. Whitehead.

BEAVER AND MILLARD COUNTIES.

DICKERT & MYERS SULPHUR COMPANY.—Ferdinand Dickert is visiting Omaha, St. Louis, and Chicago, to obtain, if possible, satisfactory rates for sulphur shipments from Millard County, Utah, to those centres. The formation of the country near this company's mine, says the Salt Lake *Tribune*, indicates that claims located adjoining the company's property may develop equally valuable sulphur deposits. The country there is one vast natural pot; either the crater of an old volcano, or where an upheaval has left inexhaustible quantities of sulphur. It is quarried rather than mined, with pick and shovel, in chunks of any size, workmen not being able to go below six feet in depth at a time because of the heat and escaping sulphurous gases. The sulphur as dug up is mostly 90 to 95 per cent pure, so that grinding is about all the requisite in preparation for the market.

SALT LAKE COUNTY.

A strike of natural gas near Salt Lake City is reported.

SUMMIT COUNTY.

DALY MINING COMPANY.—During September there were produced 55,996·59 fine ounces of silver; the ore sales amounted to $24,971.06. The total production for the nine months of this year amounted to $520,-236 fine ounces of silver and ore, sales amounting to $216.162.56.

ONTARIO SILVER MINING COMPANY.—The production for September amounted to 83,343·88 fine ounces of silver and $60,563.75 in ore sales. The total production for the nine months of this year amounted to 817,453·82 fine ounces of silver and $598,462.08 for ore sales.

WEST VIRGINIA.

WOOD COUNTY.

UNITED STATES OIL COMPANY.—This company, which has recently been organized, has leased a large tract of land in Wood County, near Volcano, and will bore for oil and gas there. The principal place of business is to be Wheeling. The following persons are interested in the enterprise: J. K. Botterford, Thomas P. Shallcross, P. Kennedy, and C. M. Frissell, of Wheeling; J. M. Cooper, Wellsburg; Oliva Peck, St. Clairsville, O.; W. T. Chambers, Elm Grove.

WISCONSIN.

MILWAUKEE AND MINNEAPOLIS MINING COMPANY.—This company has been organized with a capital stock of $6,000,000, shares $25 each, to work property on the Gogebic Range near the Wisconsin Central Railway, about twenty miles west of Hurley. The company's option is renewal from year to year. The incorporators are L. F. Frisby, F. G. Gilson, of Milwaukee, and T. B. Lewis, of Hurley.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Oct. 14.

Statistics.

Production Anthracite Coal for week ended October 8th, and year from January 1st:

Tons of 2240 lbs.	1887. Week.	1887. Year	1886. Year.
P. & Read. RR. Co..	163,031	5,516,670	8,695,682
Cent. R. R. of N. J.	89,347	3,775,097	*
L. V. RR. Co....	135,649	4,885,451	4,660,003
D., L. & W. RR. Co.	151,761	4,298,687	3,764,907
D. & H. Canal Co..	92,630	2,852,395	2,746,184
Penna. RR.....	39,840	2,530,272	2,375,154
Penna. Coal Co.....	46,051	1,142,785	1,035,571
Penna. Canal Co...	15,117	356,669	343,700
Tota	733,426	25,358,026	23,630,201
Increase	.....	1,727,825	.....
Decrease	33,427	.....	.....

* Included in tonnage of Philadelphia & Reading RR.

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1882..... .....22 365,107 | 1884.....23,288,227
1883 ....24,431,039 | 1885..... 22,830,615

Production Bituminous Coal for week ended October 8th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1887. Week.	1887. Year.	1886. Year.
Phila. & Erie RR.....	831	16,038	7,864
**Cumberland, Md*....	81,615	2,424,687	1,829,285
Barclay, Pa.....	3,736	141,490	145,081
Broad Top, Pa.			
H. & Broad Top.. RR.	6,801	249,063	283 824
Clearfield Region, Pa.			
Snow Shoe	2,925	124,406	81,676
Karthaus (Keating)..	3,4 0	129,535	105,506
Tyrone & Clearfield..	61,279	2,419,173	1,621,613
Tipton.....	342	12,633	.....
Alleghany Region, Pa.			
Gallitzin & Mountain	14,124	729,938	519,718
Pocahontas Flat Top Coal.			
Norf'k & West. RR..	21,874	860,451	656,528
Kanawha Region, W. Va			
Ches. & Ohio RR....	28,657	1,068,942	937,375
Total.....	225,644	8,186,386	6,188,470

* Tons of 2240 lbs.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.			
West Penn RR.....	5,291	229,142	249.618
Southwest Penn. RR..	1,728	87 800	129.609
Pennsylvania RR ...	2.569	160,133	210,609
Westmoreland Region, Pa.			
Pennsylvania RR.....	40.463	1,192,488	916,840
Monongahela Region, Pa.			
Pennsylvania RR.....	7.669	319,410	304,182
Total.....	57.720	1,988,973	1,810,258
Grand total.....	283,364	10,175,359	7,998,728

Production of Coke on line of Pennsylvania RR. for week ended October 8th, and year from January 1st. Tons of 2000 pounds.

	1887. Week.	1887. Year.	1886 Year.
Tyrone & Clearfield ..	...	1,735	.....
Allegnany Region ...	5.412	191,311	142,423
West Penn. RR.....	1 861	85,405	81,804
Southwest Penn.RR .	71,582	1,119,060	2,016,947
Penn. & W. Region..	8,268	257,860	250,239
Monongahela...	3,741	93,511	108,676
Pittsburg Region....	....	38	15
Snow-Shoe..... ...	1,279	39,916	20,496
Total.....	92.133	1,788,836	2,620,530

Anthracite.

The coal trade continues in an excellent condition for producers, and a satisfactory one for consumers, though a few "foolish virgins" have had to pay for their folly, as we have been informed, as much as $5 per ton for free burning and $5.50 per ton for spot Lehigh Egg f.o.b. shipping ports. These are, however, very "fancy" prices exacted from importunity, and are no fair measure of the present selling prices, which may be quoted for free burning coals as follows: Broken, $3.75; Egg, $4; Stove, $4.35; Nut, $4.25; Pea, $2.75@$3; Buckwheat, $2.25.

The sales agents met to-day and discussed the situation in excellent spirits and the utmost good will towards each other and mankind in general; it was in fact an angelic reunion and we never again expect to hear the distressing stories of moral depravity which formerly were characteristic of this trade.

There was no question of prices raised. No one even thought of asking his neighbors what they were asking for coal, and every one was so well pleased with the present, no one cared to think of, much less discuss, the future.

The supply of coal is sufficient to "go around," and the "scarcity" is mainly artificial. Some one who has let his supply run out before thinking of renewing it now rushes around and, finding it difficult to get spot coal, orders all he requires from several of the companies, hoping out of all his orders to get what he wants, when he expects to cancel the other orders. This, of course, gives the appearance of a great under supply, but should even a small part of what is so urgently called for appear on the market, it would cancel a very much larger amount of orders. Moreover, December is approaching, when the Lake ports and canals will be closed, and thus send much more coal to this market. There is always a "slump" in December, and though there is no reason to think that prices will then decline, there is every probability of the market being easier.

At present none of the companies are booking orders for future delivery except "at the prices that may then be current."

The Lehigh strike, though still "on," show signs of approaching dissolution. The men are becoming disgusted at their treatment by the Knights of Labor organization, which promised them a large amount of "support," but has failed to pay it over in current coin. And this is aggregated by the knowledge that the steady work insured them by the condition of the market during the past month would have enabled them to earn very large wages. Many of the more intelligent of the men appreciate this state of affairs, and it is probable that not a few of Coxe Brothers and of Pardee's men will go to work on Monday.

The Anthracite Coal Shippers' Association, in Chicago, decided on the 13th inst. to advance the prices of hard coal 25 cents per ton at wholesale. The Coal Exchange, which meets to-day, is expected to advance prices to consumers.

Bituminous.

This market is fairly well supplied, though the large Clearfield and Cumberland companies are still sadly behind in their deliveries, owing to the contined scarcity of cars. Pocahontis coal still continues to arrive and is offered at $3.50 alongside, and, no doubt, as long as the market will pay this price it will continue to come forward, its output not being limited by any lack of transportation.

The market generally may be claimed firm at $3.50, with occasional buyers paying more for spot or early delivery coal of particular brands, and much urgency on the part of contractors for the early delivery of their orders.

The coal trade, looked at from any and every side, is excellent throughout the country, and the consumption of coal enormous. There is nothing in the business depending on the consumption of coal to foreshadow the near approach of the "cyclone" of "financial disaster" which Chauncey Depew predicts as almost upon us.

Buffalo. Oct. 13.

[From our Special Correspondent.]

Anthracite coal in good request for local use and to fill shipping orders. The scarcity of this fuel continues. "Cars, cars" is the cry all the time, and yet they come not. Market very firm, and dealers prognosticate another advance on November 1st.

Bituminous coal also in good demand, with a nominal advance of 10c. per ton on the better grades of each variety.

The strike in the Lehigh Valley seems to have changed many conditions of the coal trade, but want of space prevents an enumeration thereof in your columns. They are well known to all producers and dealers; therefore, perhaps, a detailed statement would not make any of your readers wiser than they are at present.

Coke without any new features. A steady trade is being done at unchanged quotations.

Mr. C. M. Underhill, of the firm of J. Langdon & Co., is reported to have said in substance as follows: "All we have to grumble at in Buffalo is that the retailers have put up the prices to consumers. The wholesale circular prices have not advanced since August 1st, but the privilege that the dealers had of two months in which to haul away their coal from the wholesale yards at the opening prices, was withdrawn October 1st, since which date retailers have been paying 25 cents more per ton for their coal, thereby covering this arrangement by advancing rates to consumers. Railroad carrying charges from the mines to Buffalo have not been changed since May, but probbly will be higher on November 1st. The stringency in the car supply has resulted in the railroads issuing orders that prevent cars going off their own lines." He also states that at many Western points prices advanced through the dealers voluntarily offering shippers a premium over the increase in order to induce larger consignments. In conclusion he remarked that the present strong market was but a temporary affair, and would depend, in the future, largely on the movement of grain cars to the seaboard; these we take on their return.

Lake freights firm and higher for Lake Michigan, and lower for Lake Superior ports. High grain freights attracting tonnage to Duluth, for which place there seems to be little coal offered. Stock of coal very light, which will u doubtedly delay the getting rid of the large fleet here. The chartering market to-day closes active but firm. A severe storm prevailed last night on the lakes. The going rates for the week were as follows: $1.25@$1.35 to Chicago, Green Bay and

Milwaukee; $1.25 to Marquette and Menominee, $1.45 to Racine and Sheboygan, $1.45@$1.50 to Manistee, $1.50 to Kenosha, 90c. to Port Huron and St. Clair, 75c. to Duluth, Superior and Saginaw; 40c. to Detroit, Toledo and Windsor, and 75c. to Bay City.

The shipments of coal by lake westward from October 6th to 12th, both days inclusive, aggregated 62,440 net tons, namely, 18,920 to Chicago, 16,580 to Milwaukee, 1180 to Detroit, 2380 to Toledo, 14,450 to Duluth, 1000 to Superior, 700 to Marquette, 350 to Saginaw, 450 to St. Clair, 500 to Manistee, 100 to Maitland, 350 to Windsor, 700 to Racine, 200 to East Tamas, 100 to Bay City, 3050 to Green Bay, 600 to to Port Huron, 200 to Sheboygan, and 600 to Menominee.

Coal charters by canal light; four loads to Syracuse, 60c. gross ton, free on and off. Nominally, $1 to Albany, and $1.40 to New York per net ton, captain to pay loading and unloading.

Receipts of coal by canal for first week in October, 3418 net tons; shipments none.

Boston. Oct. 13.

[From our Special Correspondent.]

There is an actual scarcity of coal and dealers here are beginning to be a little uneasy lest their own stocks run out before matters have improved with the companies. The common statement of the scarcity of anthracite in first hands is that the West has taken it. Figures showing this to be true would be regarded with interest and would have influence at such a time. A shortage of cars also appears to be a leading cause of short supplies of coal at tide-water. It is difficult to quote f.o.b. prices. The jobber who has coal to offer for immediate shipment can get 15 to 25 cents above advanced circular rates, according to the situation of the buyers. Therefore, trade is rather quiet, as companies do not drum orders for future delivery and dealers only supply immediate wants. We hear as high as $4.50, f.o.b., for Stove coal; $4.25 for Nut; $4.35 for Egg, and $4.15@$4.25 for Broken, f.o.b. at New York.

There is a more comfortable state of things in the soft coal market, but complaints of shortage of cars are frequent, and vessels are also scarce, more particularly at Baltimore, and matters may be worse before they are better. We quote as before $2.50@$2.60 delivered, and $3.85@$4.00 delivered.

Rates of freight are very firm at minimum, showing an improvement over recent state of things. This is due to scarcity of vessels at present.

The Vessel Owners' Association, at its recent annual meeting, did nothing to help things, unless inaction was the most desirable course, for they left the matter of rates for another season to the commissioners. Some 280 vessels were represented. Nothing was done concerning coal barge competition further than to pass a resolution protesting against the registry of foreign vessels converted into barges. The coal trade generally thinks that the association will not be very potential in the matter of rates this coming year. We quote rates, exclusive of discharging: New York, 75@85c.; Philadelphia, 95c.@$1.05; Baltimore, $1.10 @$1.20; Newport News and Norfolk, 95c.@$1.10.

The retail trade at this port has made the advance which they have threatened if coal continued strong at whol-sale. Delivered prices are: Stove, $6.25; Egg, $6.00; Furnace, $5.75; Nut, $6.25; Franklin, $7.50; Lehigh Egg, $6.25; Furnace, $6.00. Wharf prices are 50 cents less than the foregoing.

Pocket dealers have also worked up the goods to the following:

	Broken.	Egg.	Stove.	Nut.	Pea.
Hard White Ash.....	5.25	5.40	5.65	5.25	3.75
Free " "	5.00	5.25	5.65	5.25	3.75
Lykens Valley..... ..	5.75	6 50	6.50	....	....

Gray & Parker, coal jobbers, have been incorporated as the Gray & Parker Company, $100,000 cash paid in; Ware B. Gray, President; Frederic Parker, Treasurer; F. S. Parker, Clerk.

Pittsburg. Oct. 13

[From our Special Correspondent.]

Coal is without notable change in this market, but lower at Cincinnati, although they complain of short supply, owing to the scarcity of empties. There is very little coal being mined in the pools, prices in the Cincinnati market afloat second pool 10c. per bush.; fourth pool, 9½c. Price of coal in the pools: Price of coal f.o.b., first pool, $4.50; second pool, $4.25; third pool, $3.65; fourth pool, $3. Coke at ovens, per ton, blast-furnace, $2; crushed, $2.60; foundry, $2.60.

Coke.—The cry is still for more cars. Here is one case: St. Louis wants 50 cars per day, and is only receiving 15. Report says unless relief soon comes certain furnaces will be obliged to "bank." Price of coke nuchanged.

FREIGHTS.

The latest actual charters to Oct. 13th, per ton of 2240 pounds:

From New York to:—Boston, 80*; Bridgeport, 75; Cambridge, Mass., 80*3c.; Cambridgeport, 80*3c.; Chelsea, 80*; E. Boston, 80*; E. Cambridge, 80*3c.; E. Greenwich, 85@90; Fall River, 85@90; New Bedford, 90; New Haven, 75; New London, 80; Newport, 85; Norwalk, Conn., 75; Portsmouth, N. H., 90*; Providence, 85@90*; Salem, 80*.

From Philadelphia to:—Alexandria, 85; Annapolis, 65; Baltimore, 60§; Bangor, 1.00*; Boston, 95@1.05; Cambridge, Mass., 1.05; Cambridgeport, 95@1.05*; Charleston, 75; Charlestown, 95@1.05*; Com. Pt., 95@1.05; E. Boston, 95@1.05*; E. Cambridge, 95@1.05*; Galveston, 2.75; Gardner, Me., 1.05*; Georgetown, 85; Lynn, 1.05@1.25; New Bedford, 75@80; New York, 90§; Norfolk, Va., 55@60; Portland, 95@1.00; Portsmouth, N. H., 1.0 @1.05*; Richmond, Va., 75; Saco, 1.20*; Salem, 1.00@1.05*; Savannah, 90@1 00; Troy, 1.10§; Washington, 85; Wilmington, 75.

From Baltimore to:—Bangor, 1.15; Bath, 1.15; Boston, 1 15; Bridgeport, 1,00; Bristol, 1.00; Brooklyn, 1.00; Charleston, 80@95; Fall River, 1.00; Galveston, 2.75; New Bedford, 1.00; Newburyport, 1.30; New Haven, 1.00; New London, 1.00; New York, 1.00; Portland, 1 15; Portsmouth, N. H., 1.25; Providence, 1.00; Salem, 1.15; Savannah, 1.00@1.10; Somerset, 1.00; Williamsburg, N. Y., 1.00; Wilmington, 1 00.

* And discharging. † And discharging and towing. 3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. †† Pilotage. ** Below bridge. *** Old B. L.

MARKETS.

NEW YORK, Friday Evening, Oct. 14.

Prices of Silver per ounce troy.

Oct.	Sterling exchange	Lond'n Pence.	N. Y. Cents	Oct.	Sterling exchange	Lond'n Pence.	N. Y. Cent.
8	4.84½	44⅜	96	12	4.85	44	95⅜
10	4 84½	44⅜	96	13	4.85	44	95⅜
11	4.84½	44 5-16	96*	14	4.85	44	95⅜

* Weak.

The market closes dull, owing to the uncertain tendency of the Eastern Exchanges.

Foreign Bank Statements.—The governors of the Bank of England at their weekly meeting made no change in its rate for discount, and it remains at 4 per cent. During the week, the bank lost £115,000 bullion, but the proportion of its reserve to its liabilities was raised from 38·64 to 41·59 per cent, against a gain from 35⅝ to 37½ per cent in the same week of last year. The weekly statement of the Bank of France shows a loss of 14,625,000 francs gold and a loss of 2,650,000 francs silver.

Copper.—The past week has shown a marked contrast with the activity displayed during the preceding weeks, having been almost devoid of any interest whatever. Under the influence of this inactivity, prices have declined somewhat, to 10·40, or perhaps 10·35 for spot Lake Copper. In futures no transactions whatever have taken place, although it is well known that there are buyers for large quantities for some months ahead, but these orders can not be filled. The fresh accident at the Calumet & Hecla mine (the bursting of an air compressor), although not in itself of much importance, must again to some extent affect the production at that mine.

The European markets continue steady, with Chili Bars ruling between £39 15s. and £39 17s. 6d., with about 12s. 6d. higher for three months forward. Best Selected, £45 10s. to £45 15s.; Tough Copper, £43 to £43 10s.

The exports of copper during the past week have been as follows:

To Hamburg—Old copper:				
By S.S. Rhaetia.. ..	* 13 casks ‖ *3 h'gsh'ds ‖		28,736 lbs.	$2,155
" Gellert.....	10 bars cop. bul.		600 lbs.	1,500
To Antwerp:				
By S.S. Belgenland..	107 cks. copper.		81,250 lbs.	7,812
To Liverpool:				
By S.S. Egypt	8,557 sks. matte		990,480 lbs.	51,000
" Spain	6.990	"	735,280 lbs.	40,000
" Britannic ..	3,263	"	359,468 lbs.	18,000
" Wyoming..	6,315	"	736,350 lbs.	32,000
" Ohio	2,239	"	255,780 lbs.	13,000
" City of Richmond . ..	3,000	"	342,026 lbs.	15,000
" Britannic ..	810 bars. cop.		199,698 lbs.	20,000
" Wyoming .	9 pks. old brass.		9,206 lbs.	405
" City of Richmond	84 bdls. ‖ 2 bbls. ‖ yellow metal and old sheeting		8,970 lbs.	45

* In transit.

Tin.—The upper movement in London market has continued, and pretty large transactions have taken place at the rise. Prices have advanced to £106 15s. to £106 17s. 6d. for spot, whilst futures are quoted £1 less, and even below. Consumers only buy to cover their actual requirements and show no disposition to purchase ahead. All advices tend to show that heavy shipments may be expected from the East up to the end of the year, and with these large arrivals coming to hand it can scarcely be anticipated that the present range of prices will be maintained much longer. The transactions on our Metal Exchange here have been somewhat considerable this week, and spot tin has been paid up t 23·75c., at which price there are now no sellers. October tin has been sold at 23·50c.; November at 23¼c.; December, 22·90c.@23c., and January at 22·85.

Lead.—Market very quiet, with somewhat of a declining teudency. Sales, 300 tons at $4.35 and $4.30. Buyers very much inclined to hold off, so that the light demand is causing the decline, even though the offerings are very light. Closing quotations are $4.30 bid, and $4.35 asked. The foreign markets exhibit equal weakness, Spanish lead being quoted £11 17s. 6d. in London, and English lead $12 5s.

Messrs. John Wahl & Co., of St. Louis, telegraph to-day as follows:

Lead very dull on the down grade; worth nominally 4·12½ to 4·15. Light sales at these figures are reported.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows:

The market remains about the same, if any thing a shade weaker. Spot nominally 4·20@4·22½. Futures are gettings sickly at 4·15 asked. Buyers expecting a decline are holding off, and buy only for immediate want.

Spelter.—This metal remains very steady at 4⅝c., Foreign spelter being quoted at 5·15@5·25c., according to brand. In this market in Europe the quotations are now for ordinaries £15 5s., and for special brands, £15 10s. to £15 12s. 6d.

Sheet Zinc is 6¼@6¾c.

Antimony.—The continued firmness of English holders has induced importers to raise their prices. Hallet's, 8·80@8⅞c.; Cookson's, 9¼@9⅝c.

We hear Domestic (Ark.) Antimony is offered at 8¼c.

Quicksilver.—The English market is very firm at £7 12s. 6d., the price ruling here being $42½ per flask.

Nickel is somewhat firmer, and continues in good demand, the present quotation being about 65c.

Chemicals.—To incorporate in these columns a complete and reliable review of the chemical trade has long been our desire, and it has been anxiously and repeatedly demanded of us by a large section of interested readers. If we have not done so hitherto, it is because, as strictly representatives of the scientific and manufacturing industries of this country, we have sought, and shall ever seek, to discourage, by every means at our command, the enormous and increasing importation from abroad of goods that we could profitably, and with much more credit to ourselves as a great nation, manufacture at home. The signs of the times unmistakably point to an increased desire on all sides to modify the existing order of things, and just as we have ceased to import our fertilizers, so we may reasonably hope soon to produce all the alkali, bleaching powder, and other so-called "heavy chemicals," needed for our consumption. To this end, our efforts will continue to be directed; we shall devote to its promotion that energy which we have been accustomed to introduce into all our undertakings; and shall be assisted by the most prominent specialists and technical managers and superintendents abroad, as well as in this country.

To those engaged in the trade, and who are accustomed to watch its movements and fluctuations from day to day, the actual state of the wholesale markets presents no feature of unusal interest. We have therefore no opportunity for commencing our comments with any startling announcements, and may content ourselves with a mere reference to the latest obtainable prices, printed on page 285.

From the standpoint of either the manufacturer, broker or extensive consumer, it must be borne in mind that the whole of that branch of the chemical industry relating to the production of sodium compounds and bleaching powder, is in a state of transition, that the very continuance of the existence of Leblanc's process is an open question, and that despite the superhuman efforts of invested capital and the gallant struggles of old manufacturers who have been enriched by it, new inventions are daily being discussed, tried, rejected, and adopted, with a view to replacing it by cheaper and less complicated methods. We can therefore understand and appreciate the reluctancy of buyers, and especially of those who are in the habit of making forward contracts, and the generally uncertain and uncomfortable feeling which has for some time past prevailed in this important trade. We learn that in Sicily brimstone there is a much weaker tendency, and rumors reach us of contracts for future deliveries at $18 per ton for best thirds; we do not, however, consider this a matter for much surprise and shall expect to see far lower figures. Sulphuric acid makers are said to be offering their 66 degree B, guaranteed free from arsenic at 90c. per 100 pounds, and even less for large contracts, but we have no record of any transactions of importance at this, or indeed any other figure. In short, as we said at the beginning, every thing is dull, and even bleaching powder, despite the efforts that are made to push it up, is readily quoted at 2c. for delivery during the month, with very little real excitement on the part of buyers.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 14.

The coal troubles in the Lehigh region have made themselves decidedly felt in the anthracite iron furnaces We called attention last week to the probability that the quality of pig-iron would be affected by the cutting off of the usual supplies of anthracite, forcing the furnaces to use what coal they could get. Some of the leading producers have notified their customers that they are unable to make good iron on account of the quality of the coal they are obliged to use, and there is even talk of stopping the furnaces until the coal strikes shall be adjusted. It is somewhat remarkable that, in the face of the scarcity of high brands of pig-iron, there is no tendency yet observed to an advance in prices. This is to be accounted for by the general lowering of prices in all kinds of iron and steel.

Scotch irons are lower abroad by 3d.@is. Quotations here are nominally unchanged from our report of last week.

No new business is reported in Bessemer pig or spiegel. Steel blooms and billets are without life. The lowering of prices of steel rails has put to a disadvontage those rail mills which depend on foreign blooms for their supply, the margin between the prices of blooms and of rails being much smaller than it was a few months ago.

Steel rails are decidedly weaker, and are quoted $34 @$35. We hear of sales of several small lots aggregating about 9000 tons between these figures. It has been proposed to close all the steel rail mills for six weeks or two months. The meaning of this is obvious —there are not enough orders in sight to run the mills up to their full capacity.

This is doubtless due to the fact, which we pointed

WEEKLY REGISTER OF

CURRENT QUOTATIONS.

This list is the result of careful compilation and is destined to meet the demands of all classes of subscribers. The prices quoted are those actually ruling in our own and foreign markets. Manufacturers and importers will please give notice of all modifications not later than Friday noon each week.

CHEMICALS.

Acid—Sulphuric, 60°, per 100 lbs..	90
Sulphuric, 66°, per 100 lbs	
Hydrofluoric, per 100 lbs.....	95
Muriatic, 18°, per 100 lbs	1.15
Muriatic, 20°, per 100 lbs.... . .	1 25
Nitric, 36°, per 100 lbs	4 00
Nitric, 42°, per 100 lbs....	6.00
Alkali—36 p. c	1.10
Refined, 58°.....	1.15
Alum—Lump, per lb.....	1¾
Ground, per lb	2
Per ton, Liverpool lump	£5
Sulphate of Alumina	£4 12 0
Aluminum—(Metallic), per lb...12.00	
Ammonia—Sulph., per 100 lbs..	3.00
Carb , per lb.....	7¾
Muriate, per lb...	7
Antimony—Hallet's, per lb.....	8¼
Cookson's, per lb	9¼
Arsenic—Metallic, per lb.....	3c
White, powdered, per lb	2¾
White, glass..	
Red. per lb	6½
Plymouth, white, per ton.....	
Asbestos—American, p. ton.....20.00	
C. i. f. £, pool, Italian, p. ton.....	
Asphaltum—P. ton 13.00	
Barium—(Metallic), per lb.....975.00	
Barytes—Sulph., Am. prime white, p. ton 16.00	
Sulph., foreign, floated, p. ton....19.00	
Sulph., off color, p. ton 12.50	
Carb., lump..	
No. 1, casks, Runcorn.....	
No. 2, bags, Runcorn.....	
Bismuth—(Metallic), per lb.....	2.40
Bleach—Over 35 p. c., per lb	2
Borax—Per lb	6¼
Refined at Liverpool, per ton.....	
Bricks—Pale, per 1,000	5.00
Jerseys, per 1,000	7.50
Haverstraw, per 1,000.....	8.50
Front bricks, per 1,000, from.....10.00	
Brimstone—*See Sulphur.*	
Bromine—Per lb....	36
Building Stone—Amherst freestone, per cu. ft., from....	75
Brownstone, per cu. ft., from.....	1 00
Granite, rough, per cu. ft., from..	45
Cadmium—(Metallic), per lb.....	1.45
Calcium—(Metallic), per oz.....150.00	
Cæsium—(Metallic).....	
Cerium—(Metallic), per oz..... .	168
Cement—Rosendale, per bbl.....	1 00
Portland, American, per bbl.....	2.00
Portland, foreign, per bbl....	2 25
Chalk—Per ton.....	3.00
Precipitated, per lb.....	4
China Clay—English, per ton....	1.00
Southern, per ton 13.50	
Chrome Yellow—Per lb	8
Chromium—(Metal ic), per lb...200.00	
Cobalt—(Metallic), per lb.....	7.00
Cobalt—Oxide, per lb..... ...	2.15
Copper—Sulphate English Works, per ton..... .....£14 5 0	
Precipitated, at English Works, per unit.....	8 6
Copperas—Common, per lb.....$	70
Best, per lb.....	1.20
Liverpool, per ton, in casks, £2...	1.20
Cream of Tartar—Am. 99 p. c. per lb	35
Powdered, 99 p c.....	36
Didymium—(Metallic), per oz...160.00	
Emery—Grain, per lb	3½
Flour, per lb	2½
Erbium—(Metallic), per oz... ...140.00	
Feldspar—Ground, per ton... ...14.00	
Fuller's Earth—Lump, per bbl.	95
Powdered, per lb	2
Gallium—(Metallic), per oz 3250.00	
Glucinum—(Metallic)	
Green—Emerald.....	
Brunswick.....	
Gypsum—Calcined, per bbl..	1.25
Indium—(Metallic), per oz.....	158.00
Iodine—Resublimed.....	3.50
Iridium—(Metallic), per lb.. ...700.00	
Kainit—Per ton.....	7.25
Kaolin—*See China Clay.*	
Lanthanum—(Metallic), per oz.175.00	
Lead—Red, per lb.....	6
White, American, in oil, per lb....	6½
White, English, per lb	7½
Acetate, or sugar of.....	12
Litharge—Powdered, per lb	5½
English flake, per lb....	9
Lithium—(Metallic), per oz.....160.00	
Magnesite—Syrian, per ton.. ...15.00	
Magnesium—Per lb....	4.00
Mineral Wool—Per lb	2
Molybdenum—(Metallic) per lb	6.00
Nickel—(Metallic), per lb.. .....125.00	
Niobium—(Metallic), per oz.....128.00	
Osmium—(Metallic), per lb 640.00	
Palladium—(Metallic), per lb..512.00	
Platinum—(Metallic), per lb ..148.00	
Phosphate Rock—S. Carolina, per ton f. o. b. Charleston.....	5.75
Ground, per ton f. o. b. New York.10.00	
Canadian Apatite, lump, f. o. b. at shipping port, per unit	24
Manganese—lump, c. i. f. Liverpool, per ton £3 2 6	
Per unit, up or down..... .....£0 1 6	
Ground £6 0 0	
Metallic, per lb	1.10
Mercury—*See Quicksilver.*	
Mercuric-Chloride—(*Corrosive Sublimate*) per lb.....	55
Phosphorus—Per lb.....	70
Plumbago—Ceylon, per lb..... .	4
American, per lb.....	7
London, per cwt £0 15 0	
Potassium—Metallic, per oz.....	2.00
Cyanide, per lb	
Bromide, per lb.....	37
Chlorate, per lb.....	14
Carb. per lb.	5
Caustic, per lb	7½
Iodide	2.10
Muriate, per 100 lbs.....	1.70
Nitrate, refined, per lb....	6
Bichromate, per lb....	10½
Sulphate, per 100 lbs.....	1.10
Yellow Prussiate, per lb....	19
Red Prussiate, per lb...	42
Pumice Stone—Selected lumps, per lb.....	2½
Original cks., per lb.....	1½
Powdered, pure, per lb...	1¾
Pyrites—Non-cupreous, per unit, sulph	10
Quartz—Ground, per ton 18.00	
Quicksilver—Per lb.	53
London, per flask of 75 Ho....£7 12s. 6d.	
Rotten Stone—Powdered, per lb.	8½
Lump, per lb	5
Eng., powdered, per ton	£4
Lump, per ton.....	£5
Rhodium—(Metallic), per lb....512.00	
Ruthenium—(Metallic), per oz.112.00	
Rubidium—(Metallic), per oz...200.00	
Salt—Liverpool, ground, per bbl.	70
Turk's Island per bbl	25
Salt Cake—Per 100 lbs.....	60
Saltpeter—Crude, per lb...	4½
Refined, per lb...	6
Silenium—(Metallic)	
Slate—Purple and green roofing, per 100 sq ft	6.00
Red roofing, per 100 sq. ft... ....15.00	
Black, roofing, per 100 sq. ft. ...	5.00
Soda Ash—Carbonate, 48 p. c., per 100 lbs	1.20
Caustic, 48 p. c., per 100 lbs.. . .	1.22
Caustic, 70 p. c., per 100 lbs.....	1.13
Sal, English, per 100 lbs	1.00
Sal, American, per 100 lbs	1 15
Nitrate per 100 lbs...	1.95
Sodium—(Metallic) per lb.....	4.50
Strontium—(Metallic), per oz..128.00	
Nitrate, per lb	10½
Sulphur—Roll, per lb.....	1½
Flour, per lb	1¾
Crude Brimstone, seconds, per ton..... ....20.00	
Crude Brimstone, thirds, per ton..19.00	
Talc—Ground French, per lb.. ...	1¼
Domestic, per lb.....	6
Domestic, per ton..... ... .15 00	
C. i. f. Liverpool, per ton..... .	£4 5 0
Tannin—Pure, per lb.	
Tantalum—(Metallic) per oz... 144.00	
Tellurium—(Metallic) per oz.... 9 00	
Thallium—(Metallic) per oz..... 3.00	
Titanium—(Metallic) per oz....32.00	
Thorium—(Metallic) per oz.....272.00	
Tungsten—(Metallic) per oz..... 4.00	
Vanadium—(Metallic), per oz..320.00	
Vermillion—American, per lb...	50
English, per lb.	65
Vitriol—(Blue), Ordinary, per lb..	4½
Extra, per lb	4¾
Yttrium—(Metallic), per oz ... 144.00	
Zinc ox de—American, Dry, per lb.	4¼
Antwerp, Red Seal, per lb.....	5⅝
Paris, Red Seal, per lb	6⅛
Zirconium—(Metallic), per oz..240.00	

out last week, that the country can not go on building railroads at the rate of this year's work. Prices of rails have been lowered sufficiently to discourage foreign competition, and the American rail mills, under their admirable system of working in harmony, can produce all the rails needed here in 1888.

Old rails are a little firmer. We hear of new sales of several lots, aggregating over 6000 tons at about $22.50.

It is stated that Mr. E. S. Wheeler, of New Haven, is to resume business as manager of the E. S. Wheeler Company, a new corporation, with a capital of $25,000, of which Mr. Wheeler's wife and his brother-in-law, Mr. Pierce N. Welch, are the chief stockholders. So far as is now known, the assets of the old firm of E. S. Wheeler & Co. will amount to about 10 per cent. of their liabilities.

Mr. Samuel W. Briggs, of C. H. Delamater & Co., the assignee of Messrs. Thos. J. Pope & Bro., has nearly prepared his statement of that firm's condition, and expects to be ready to file the statement very shortly.

The ruling quotations are as follows :

American Pig-Iron.—No. 1 X, $21@$21.50 ; No. 2 X, $18.50@$19.50; Forge, $17@$17.50, all at tidewater.

Scotch Pig.—Coltness, $21.75@$22.00; Clyde and Dalmellington, $20@$20.25 ; Summerlee, $21.75@$22 ; Gartsherrie, $21 ; Shotts, $21@$21.25.

Cables to the Metal Exchange to-day quote Warrants, 39s. 11d.

Coltness, 52s. ; Langloan, 48s. ; Summerlee, 50s. ; Gartsherrie, 47s.; Glengarnock, 47s. 6d.; Dalmellington, 43s. 3d. ; Eglinton, 42s.

Bessemer Pig.—Foreign, nominally $20.25; Domestic, about $19.50 at Eastern furnaces.

Spiegeleisen.—English 20 per cent, $27; German, $26.25 ; 30 per cent, $31.50 ; Ferro, $58.

Steel Blooms.—$30@$30.50, nominally.

Steel Billets.—$30@$30.50, nominally.

Steel Nail Slabs.—$30.50@$31.

Steel Wire Rods.—$40.50 for shipment.

Steel Rails.—Heavy sections, $34@$35 at mill, according to size of order and time of delivery. Light sections, $37.50@$42 at mill.

Structural Iron and Steel—At mill : Bridge Plate, 2¼@3c. : Angles, 2·3@2·6c. ; Tees, 2·6@2·8c., Steel Angles, 2·6@2·75c. From dock, Beams and Channels, 3·3c., base.

Steel Plates.—On wharf : Tank and Ship, 2·85@3c. ; Boiler Shell, 3@3¼c. ; Boiler Flange, 3½@3¾c. ; Boiler Fire-Box, 4@4½c.

Merchant Steel.—American Tool Steel, 7½@10c. ; special grades 10@20c. ; Crucible Machinery Steel, 4½@6c. ; Crucible Spring, 4@4½c. ; Bessemer Machinery and Spring, 2·7@3c. ; Bessemer Cutlery, 3·2c.

Plate Iron.—Common Tank, 2·4@2·5c. ; Refined, 2·5@2·6c. ; Boiler Shell, 2·7@2·8c.; Boiler Flange, 3·7@3·8c. ; Extra Flange, 4½@4½c.

Bar Iron.—For Refined, 2 @2·1c., base at wharf; Common, 1·9@2c., base at wharf.

Cast-Iron Pipe.—$31@$37, according to size.

Wrought-Iron Pipe.—List of Edward Barr Co., Ltd., adopted Oct. 5 : Butt-welded, plain, 50 per cent discount ; Galv., 40 per cent. Lapp-welded, plain, 60 per cent discount ; Galv., 45 per cent.

Boiler Tubes.—55 per cent discount ; Casing, 50 per cent.

Rail Fastenings.—Spikes, 2·3@2·4c., delivered ; Angle Fish-Bars, 2·15@2·2c. ; Bolts and Square Nuts, 2·9@3c. ; Bolts and Hexagonal Nuts, 3·1@3·2c.

Wrought Scrap Iron.—Foreign, ex ship, $20.50@$21; No. 1 yard scrap, $21.50@$22.

Cast Scrap Iron.—$17@$17.50.

Old Car Wheels.—$19@$19.50.

Old Rails.—Tees, $22.25@$22.50 ; Double Heads, $22.50@$23.

Nails.—$2@$2.05 in car-load lots ; $2.05@$2.10 from store.

Louisville. Oct. 12.

[Reported by GEO. H. HULL & Co.]

The pig-iron market has weakened somewhat during the past week. In business circles there seems to be an uneasy expectation of tight money, which, however, many of our conservative business men do not think will be realized. The market is in such a condition that very little will effect it either way. The expected rise in Southern rivers will release considerable iron that has been held all summer for lack of transportation. Such buyers as have inquired for large lots have been unable to secure them, the principal furnaces being sold largely ahead. Resumption of navigation will, to a certain extent, relieve this scarcity. Very few large sales have been booked during the past week.

We quote for cash in round lots as follows :

PIG-IRON.

Southern Coke, No. 1 Foundry.....	$20.50@$21.00
" " No. 2 "	19 50@ 20.00
" " No. 2½ "	19.00@ 19.50
Hanging Rock Coke, No. 1 Foundry	21.00@ 21.50
" " Charcoal, No. 1 Foundry...	24.00@ 25.00
Southern Charcoal, No. 1 Foundry.... ...	21.00@ 22.00
Silver Gray, different grades.....	18.00@ 19.50
Southern Coke, No. 1 Mill, Neutral.....	17.75@ 18.25
" " No. 2 "	17.00@ 18.00
" " No. 1 Mill, Cold Short...	17.00@ 18.00
" Charcoal, No. 1 Mill	18.00@ 19 00
White and Mottled, different grades	15 50@ 16 00
Southern Car-Wheel, Standard Brands....	25 00@ 26 00
" " Other "	22.00@ 24.00
Hanging Rock, Cold-Blast.....	25.50@ 26.50
" " Warm-Blast..	22.00@ 23.00

Pittsburg. Oct. 13.

[From our Special Correspondent.]

The iron trade of the week was not very active. The inclination of consumers was to hold off or purchase limited amounts for immediate use. The volume of business shows quite a falling off as compared with previous weeks. In the meantime we are assured by parties that ought to be well informed, that stocks in first hands are less than they have been for some time. There is from some cause or other a want of confidence in regard to the future, and this is no doubt producing a demoralizing effect on the trade. The coke question remains unchanged. The men, for reasons no doubt satisfactory to themselves, don't show the usual anxiety to strike. Are the K. of L. losing their influence ? To an outsider it looks that way. During last month the leaders gave the coke manufacturers twelve days to sign the "Frick" scale or the men would be ordered out. The scale is not yet signed, neither did the men quit.

It may be as well for the master workmen to understand once for all that the coke men are almost a unit in declaring that the Frick scale will never be signed. Mr. Carnegie and H. C. Frick are now on their way home, and will be due at New York on Sunday. The coke question is waiting their arrival. Pig-iron is undoubtedly weaker than at date of last report. While certain dealers are holding out for top figures, there are others who are disposed to accept a decline. City furnaces generally are not inclined to make concessions, at the same time outside lots can be purchased at lower than quoted rates. Bessemer is weak, but not quotably lower. Old rails are very dull. There are New York parties here anxious to sell. Scrap material is dull; prices very uncertain. Muck bar is quiet, very little doing. Taken as a whole the week's business has been light.

Coke or bituminous :	$	$
Foundry No. 1	20.00@	20 50
Foundry No. 2	19.00@	19,50
Gray F., No. 3	18.00@	18.25
" " No. 4	17.75@	18.00
White	17.00@	17.50
Mottled.....	17.00@	17.50
Silvery	19.00@	19.50
Bessemer.....	21.00@	21.25
Charcoal :		
Foundry No. 1	25.00@	25.75
Foundry No. 2	24.00@	24.75
Cold-Blast.....	26.00@	30.00
Warm-Blast....	25.00@	27.00
20 p. c. Spiegel	29.00@	.....
Muck-Bar.....	31.00@	31.25

	$	$
Steel Blooms	32.00@	32.50
Steel Slabs ...	31.00@	32.00
Steel Crop Ends. . . .	@	22.00
St'l Bl'm Ends.... ..	@	21.50
Steel Billets....	31.50@	3 .00
Old Iron Rails..	25.25@	25 75
Old Steel Rails..	23.50@	24.50
No. 1 W. Scrap.	20 50@	21.00
No. 2 W. Scrap.	19.00 @	19.50
Steel Rails ...	37.00@	38.00
" light sect's.	38.00@	42 00
Bar Iron, nom.	1.90@	2.00

Nails $2 net car lots.
Steel Nails $2 net car lots.
Two per cent off for cash.

SALES SINCE OUR LAST REPORT.

Coal and Coke Smelted Lake Ore.

1000 Tons Gray Forge.....	18.00 cash.
500 Tons Neutral Mill	18.00 cash.
250 Tons Neutral Mill.....	18.35 cash.
175 Tons No. 1 Foundry, all ore.....	20.85 cash.
100 Tons No. 1 Foundry..... ..	21.00 cash.
25 Tons No. 1 Foundry, all ore.	21.50 4 mo.
250 Tons Gray Forge.....	18 00 cash.

Coke Native Ore.

150 Tons Gray Forge...	17.75 4 mo.
125 Tons Gray Forge.....	18.00 cash.
100 Tons Gray Forge, all ore.....	18 50 cash.
25 Tons Gray Forge.....	17.75 cash.
20 Tons Slivery...	19.00 cash.

Old Rails.

1060 Tons Imported Ts...	25.25 cash.
250 Tons Imported D. H.....	25.75 cash.

Scrap Materials.

200 Tons Open-Hearth Steel, gross..	22.00 cash.

Steel Billets.

300 Tons Billets.....	32.50 cash.

Steel Wire Rods.

500 Tons Imported, New York delivery.....	40.75 cash.

Philadelphia. Oct. 13.

[From our Special Correspondent.]

The general conditions of the Pennsylvania iron trade are not quite so favorable as a week ago. While there is no pronounced weakness there is not that elasticity of the market that manufacturers and brokers generally expect about this season of the year. No one seems able to account for it. The statistics of production and consumption are all right and do not indicate that there is such an over production as should call for restriction. Three blast-furnaces have blown out in this locality, but two of them will start up as

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last.			Dividends. Total paid.	Dividends. Date and amount of last.		
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*	...	...	...	$555,000	Jan	1887	10
2	Alice, S. C.	Mont	10,000,000	400,000	25	*	...	...	...	750,000	Sept	1886	.06⅔
3	Alturas, G	Idah.	1,500 000	3 0,000	5	...	...	...	...	95,000	Sept	1888	.50
4	Amie Con., S. L.	Colo.	5,000,000	500,000	10	*	...	...	...	330,000	Oct.	1882	.05
5	Amy & Silversmith, S.	Mon.	...	311,419	...	...	...	...	...	247,530	Aug	1887	.12½
6	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl	1875	$1.00	360,000	Jan.	1887	$1.00
7	Argenta, S	Nev..	10,000,000	100,000	100	295,000	July	1885	.10	40,000	Feb.	1880	20
8	Aurora, L	Mich	1 000,000	40,000	25	...	...	...	...	155,000	Oct	1887	1.87½
9	Bassick, G. S.	Colo.	10,000,000	100,000	100	*	...	...	...	400,000	Mar.	1884	1.00
10	Belle Isle, S.	Nev..	10,000,000	100,000	100	160,000	Feb	1887	.20	300,000	Dec.	1879	.25
11	Belcher, G. S.	Nev..	10,400,000	104,000	100	2,269,335	Sept	1887	.50	15,397,000	Apl	1876	1.00
12	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	26,250	Dec.	1883	10	200,000	Jan	1887	.10
13	Big B'nd Hydraulic, G	Dak..	1,000,000	200,000	5	*	...	...	...	253,000	Aug	1887	.03
14	Black Bear, G.	Cal..	3,000,000	30,000	100	22,500	Dec	1884	.25	895,000	May	1883	.20
15	Bodie Con., G. S.	Cal..	10,000,000	100,000	100	424,990	Aug	1887	.50	1,602,572	Apl.	1885	.50
16	Bonanza Developm't	C &M	3,000,000	300,000	10	...	...	...	...	135,000	Oct.	1882	.15
17	Bonanza K'g, Cons. S.	Cal..	1,000,000	100,000	10	*	...	...	...	185,000	Feb.	1885	.10
18	Boston & Mont, G.	Mont	2,500,000	250,000	10	*	...	...	...	520,000	Jun	1886	.15
19	Breece, S.	Colo.	5,000,000	200,000	25	*	...	...	...	2,000	Feb.	1880	.01
20	Brooklyn Lead, L. S	Utah	500,000	50,000	10	...	...	...	...	127,000	July	1887	.05
21	Bulwer, G.	Cal	10,000,000	100,000	10	60,000	July	1887	.20	175,006	Jan.	1884	.10
22	Caledonia, G.	Dak	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10
23	Calumet & Hecla, C	Mich	2,500, 00	100,00	25	1,200,000	...	...	...	29,350,000	July	1887	5.00
24	Carbonate Hill, S. L.	Colo.	2,000,000	200,000	10	*	...	...	...	80,000	Apl.	1884	.05
25	Caribou Con., S.	Colo.	1,500,300	150,000	10	*	...	...	...	50,000	Mch	1880	.10
26	Castle Creek, G.	Idah.	100 000	100,000	1	...	...	...	...	51,000	Oct.	1883	.03
27	Catalpa, S. L.	Colo.	3,000,000	300,000	10	*	...	...	...	270,000	May.	1884	.10
28	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,820,000	Feb	1887	2.00
29	Christy, S.	Utah	10,000,000	100,000	100	...	...	...	...	10,000	Jun.	1885	.10
30	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*	...	...	...	1,650,000	Dec.	1884	.25
31	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*	...	...	...	227,625	Oct.	1887	.05
32	Cons. Cal. & Va., G. S	Nev..	21,600,000	216,000	100	108,000	Jan.	1885	.20	1,144,000	Oct.	1887	.50
33	Con. Gold Mining, G.	Ga..	500,000	100,000	5	*	...	...	...	108,000	Nov.	1884	.02
34	Contention, S	Ariz.	12,500,000	250,000	50	...	...	...	...	‡2,587,000	Dec.	1884	.25
35	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*	...	...	...	210,000	Aug.	1886	.05
36	Crown Point, G. S.	Nev..	10,000,000	100,000	100	2,675,000	Feb.	1884	.25	11,588,000	Jan.	1887	2.00
37	Daly, S. L.	Utah	3,000,000	150,000	20	...	...	...	...	30 1,000	Sept	1887	.50
38	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*	...	...	...	188,000	Oct.	1887	.10
39	Derbec B. Grav., G. S.	Cal..	10,000,000	100,000	100	90,000	Dec.	1881	.10	184,000	May	1887	.10
40	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*	...	...	...	95 1,000	Oct	1887	10
41	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1889	.50	180,000	July	1887	.05
42	Empire Lt, G.	Mont	500,000	100,000	5	...	...	...	...	33,000	Mar	1887	...
43	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	500,00	July	1886	1.00	4,842,5 0	Oct.	1887	.25
44	Evening Star, S. L.	Colo.	500,000	50,000	10	*	...	...	...	1,400,000	Nov	1883	.50
45	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1880	.25
46	Father de Smet, G.	Dak..	10,000, 00	100 000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885	.20
47	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun	1871	...	560,000	Dec.	1886	1.00
48	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*	...	...	...	190,000	July	1886	.10
49	Fresno Enterprise, G	Cal..	5,000,000	100,000	50	...	...	Mch	1883	.10	110,000	July	1882	.10
50	Garfield Lt., G. S	Nev.	500,000	100,000	5	...	...	...	...	25,000	Mar.	1885	.12½
51	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	4,150,400	Jun	1887	.50	3,826,000	Oct.	1870	10.00
52	Grand Central, S.	Ariz.	1,000,000	100,000	10	...	...	...	...	625,000	Dec.	1882	.25
53	Grand Prize, S.	Nev.	10,000,000	100,000	100	570,000	Apl.	1886	.50	495,000	Mar.	1881	.25
54	Granite, S.	Colo.	125,000	125,000	1	...	...	...	...	6,250	May	1883	.01
55	Granite Mountain, S.	Mont	10,000,000	400,000	25	...	...	...	...	3,200,000	Oct.	1887	.50
56	Green Mountain, G.	Cal..	1,250,000	125,000	10	*	...	...	...	212,000	Nov.	1881	.07½
57	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	5,086,800	July	1887	.50	1,598,000	Apl	1871	5.00
58	Hall-Anderson, G.	N. S..	150,000	150,000	1	...	...	...	...	7,000	Jan.	1882	05
59	Hecla Con., S. G. L. C	Mont	1,500,000	30,000	50	...	...	...	...	1,047,000	Aug	1886	.50
60	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	*	...	...	...	197,970	July	1886	.06
61	Holmes, S.	Nev.	10,000, 00	100,000	100	300,000	Sept	1885	10	75,000	Apl.	1886	.25
62	Holyoke, G.	Idah	200,000	200,000	1	...	...	...	...	27 000	Feb.	1883	.10
63	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	3,918,750	Sept	1887	.20
64	Honorine, S. L.	Utah	5 00,000	250,000	2	35,000	Jun	1883	...	125,000	Sept	1887	.05
65	Hope, S.	Mont	1,000,000	100,000	10	*	...	...	...	18 ,252	Oct.	1887	.25
66	Horn-Silver, S. L.	Utah	10,000,00	400,000	25	*	...	...	...	4,000,000	Nov.	1884	.50
67	Idaho, G.	Cal..	310,000	3,100	100	...	...	...	...	4,539,500	Apl.	1887	5.00
68	Ideal, S. L.	Colo.	1,500,000	50,000	10	...	...	...	...	15,000	Jan	1886	.05
69	Illinois, S.	N M.	100,000	100,000	1	*	...	...	...	25,000	Jan	1886	.25
70	Independence, S.	Nev..	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
71	Indian Queen, S.	Nev..	250,000	125,000	2	*	...	...	...	388,750	July	1883	.03
72	Invo, G.	Cal..	500,000	100,000	5	*	...	...	...	45,000	Apl.	1882	.05
73	Iron Hill, S.	Dak.	2,500,000	250,000	10	82,500	Oct.	1885	...	137,500	Oct.	1887	.05
74	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*	...	...	...	2,100,000	Oct.	1887	.20
75	Jackson, G. S.	Nev	5,000,000	50,000	100	10,000	Nov	1880	.20	45,000	Oct.	1886	.10
76	Jocuistita, S.	Mex.	2,500,000	250,000	10	...	...	...	...	1,200,000	Feb.	1885	.50
77	Jumbo, G.	Colo.	2,000,000	200,000	10	...	...	...	...	15 000	Jun.	1887	.02½
78	Kentuck	Nev..	3,000, 00	30,000	100	342,000	Nov	1881	.30	1,600,000	Dec.	1886	.10
79	La Plata, S. L.	Colo.	2,000,000	200,000	10	*	...	...	...	610,000	Sept	1882	.30
80	Leadville Cons., S. L. I.	Colo.	4,000,000	400,000	10	*	...	...	...	433,000	Apl	1887	.05
81	Lexington, G. S.	Mont	4,000,000	40,000	100	*	...	...	...	565,000	Jan.	1885	2.00
82	Little Chief, S. L	Colo.	10,000,00	2 0,000	50	*	...	...	...	780,000	Mch	1885	.10
83	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*	...	...	...	1,050,000	Mch.	1880	50
84	Manhattan, S.	Nev	5,000,000	50,000	100	300,000	Jun	1887	1.00	437,500	Feb	1886	.25
85	Marguerite, G.	Cal..	500,000	25,000	20	...	...	...	...	18.750	Oct.	1882	.25
86	Marion Bullion, G	N.C	500,000	...	...	...	...	...	...	15.000	Jan	1883	...
87	Martin White, S.	Nev .	10,000,00	100,000	100	1,150,000	Mar.	1886	25	140,000	Dec.	1886	.25
88	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*	...	...	...	87,500	Sept	1887	5.00
89	Minnesota, C.	Mich	1,000,00	40,000	25	420,000	Apl	1886	1 00	1,826,000	Mar.	1876	...
90	Mono, G	Colo.	5,000,000	50,000	100	610,000	Sept	1837	.50	12.500	Mar.	1837	.25
91	Montana, Lt, G. S.	Mont	3,300,00	330,000	10	*	...	...	...	1,247,400	July	1887	.75
92	Morning Star, S. L.	Colo.	1,000,00	100,000	10	...	...	...	...	725,000	July	1887	.25
93	Moulton, S. G.	Mont	2,000,000	400,000	5	*	...	...	...	35 1,000	May	1887	.07½
94	Mount Pleasant, G.	Cal.	150,000	150,000	1	*	...	...	...	150.000	Feb.	1887	.30
95	Mt. Diablo, S	Nev	5,000,000	50,000	100	137,500	Jun	1880	2.00	80,000	July	1885	.20
96	Napa, Q	Cal..	700,000	100,000	7	...	...	...	...	240,000	Jan	1883	.10
97	Navajo, G. S	Nev..	10,000,000	100,000	100	450,000	Mar.	1887	30	325,000	Feb.	1886	.25
98	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*	...	...	...	30,000	Dec.	1885	.06½
99	New York Hill, G	Cal..	5,000,000	50,000	100	62,500	Oct	1885	.15	215,000	Aug.	1882	.10
00	Northern Belle, S	Nev..	5,0 0,000	50,000	100	425,000	Jan	1884	8.00	2,400,000	Apl.	1883	50
101	North Belle Isle, S.	Nev..	10,0 0,000	100,000	100	250,000	Mar	1887	.50	3 1,000	Aug.	1883	.15
102	Ontario, S. L.	Utah	15,000,000	150,000	100	...	...	...	...	8,6 0,000	Sept	1887	.50
103	Ophir, G. S.	Nev..	10,000,000	100,000	100	4,057,800	Aug	1887	.50	1,595,000	July	1882	1.00
104	Original, S. C.	Mont	1,500,000	60,000	25	*	...	...	...	128 000	Oct	1887	.05
105	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1870	1.60	1,022,500	Jan.	1887	1 00
106	Oxford, G	N. S.	125,000	125,000	1	*	...	...	...	3 ,500	Oct.	1885	.02
107	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	47,000	Mar.	1882	.15	151,000	Apl	1887	.10
108	Parrott, C.	Mont	1,800,000	180,000	10	...	...	...	...	36,000	July	1887	.10
109	Peacock, S. G. C.	N.M.	2,000,000	200,000	10	*	...	...	...	60,000	Nov.	1886	...
110	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	10,000	Mar.	1884	10	30,000	Dec.	1882	.05
111	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*	...	...	...	20,000	Feb.	1886	.10
112	Plymouth Con., G.	Cal..	5,000,000	100,000	50	*	...	...	...	2,160,000	Nov.	1887	.40
113	Prussian, S. L.	Colo.	1,500,000	150,000	10	...	...	...	...	132,000	Jan	1883	.10
114	Quicksilver, pref., Q	Cal..	4,3 0,000	43,000	100	...	...	...	...	914,150	Aug.	1887	1.50
115	" com., Q	Cal..	5,700,000	57,000	100	...	...	...	...	151,000	July	1883	.40
116	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1862	...	4,610,000	Aug.	1887	1.00
117	Richmond, S. L.	Nev..	1,350,000	54,000	25	*	...	...	...	4,312,537	Jun.	1887	1.25
118	Ridge, C.	Mich.	5 0,000	20,000	25	220,000	Mar	1886	.50	10 ,000	Feb.	1880	.50
119	Rising Sun, S.	Dak..	750,000	150,000	5	*	...	...	...	52,000	May	1881	.07½
120	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*	...	...	...	585,000	Mar.	1886	.05
121	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20	...	...	...	...	100,000	Dec.	1882	.50
122	Rooks, G.	Vt...	500,000	50,000	10	*	...	...	...	61,000	Apr	1885	.50
123	Savage, S.	Nev..	11,200,000	112,000	100	6,3 4,000	Sept	1887	50	4,460,000	July	1889	3.00
124	Security L. Mg., Mfg.	Colo.	1,000,00	100,000	10	*	...	...	...	50,000	July	1884	...
125	Shoshone, G.	Idah.	150,000	150,000	1	...	...	...	...	7,500	Apl.	1883	.01
126	Sierra Buttes, G.	Cal..	225,000	22,500	10	...	...	...	...	1,438,964	Oct.	1886	.37
127	Sierra Grande, S.	N. M.	2,500,00	500,000	5	...	...	...	...	860,006	Sept	1884	.25
128	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,262,000	Aug.	1887	.25	102,000	Jan.	1871	1.00
129	Silver Cord, G. S. L.	Colo.	5,000,00	500,000	10	...	...	...	...	225,000	Nov.	1883	.25
130	Silver King, S.	Ariz.	10,000,00	100,000	100	...	...	...	...	2,000,000	July	1887	.25
131	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*	...	...	...	76.000	Nov	1886	.02
132	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*	...	...	...	2,032,500	Sept	1887	.20
133	Smuggler, S. L.	Colo.	600,000	60,000	10	...	...	...	...	66,700	Aug.	1885	.25
134	Socorro, C	N. M.	250,000	2,500	100	...	...	...	...	1,000	Mch	1882	.00¾
135	South Yuba, G.	Cal..	2,000,000	0 000	50	*	...	...	...	150,000	Oct.	1881	.75
136	Spring Valley, G.	Cal..	2 0,000	2 0,000	1	50,000	Oct.	1886	.25	50,000	Jan.	1881	.25
137	Standard, G. S.	Cal..	10 000,00	1 0,000	100	25,000	Oct.	1884	.25	4,425,000	Mar.	1884	.25
138	Stormont, S.	Utah	500,0 0	500,000	1	*	...	...	...	155,000	Nov.	1884	.05
139	St. Joseph, L.	Mo..	1,5 0,00	150,000	10	*	...	...	...	814,000	Sept	1887	.20
140	Sariaam, G	D G.	3,000,000	3 0,000	5	...	...	...	...	75,000	Oct.	1887	.05
141	Syndicate, G.	Cal..	10,000,000	100,000	100	34,722	July	1882	.15	48,308	Sept	1885	.10
142	Tip Top, S	Ariz	10,000,000	100,000	100	25 ,000	Sept	1883	.25	100,000	Nov.	1881	.20
143	Tombstone, G. S. L.	Ariz	12,500,000	500,000	25	*	...	...	...	1,250,000	Apl	1882	.10
144	United Verde, C.	Ariz.	3,000,000	300,000	10	*	...	...	...	97,500	Feb	1884	.20
145	Valencia, M	N. H.	150,000	1,500	100	*	...	...	...	37,500	Apl	1886	2.50
146	Viola Lt., S. L.	Idah.	750,000	150,000	5	*	...	...	...	74,500	May	1887	.12½
147	Vizina, S	Ariz.	5,000,00	200,000	25	*	...	...	...	140,000	Apl	1883	...
148	Yankee Girl	Colo	2,500,000	25 ,000	10	...	...	...	...	1,087,500	July	1887	.10
149	Yellow Jacket, G. S.	....	12,000,00	120 0	100	5,448 000	Dec	1885	.75	2,184,000	Aug.	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value	Assessments. Total levied.	Assessments. Date & am't. of last.			
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*	...	...	...	
2	Albion, S. L.	Nev..	15,000,000	150,000	100	$577,000	July	1883	.25	
3	Allouez, C.	Mich	2,000,000	80,000	25	240,000	Feb	1884	...	
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	460,000	Aug.	1887	.50	
5	Alta, S.	Nev..	10,080,000	100,800	100	2,027,000	Feb	1887	.50	
6	Amador, G	Cal..	400,000	200,000	2	*	...	...	...	
7	American Flag, S.	Colo	1,250,000	125,000	10	300,000	Jun	1877	.50	
8	Anglo-Montana, Lt.	Mon.	600,000	120,000	5	...	...	...	...	
9	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5	...	...	...	...	
10	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10	...	...	...	...	
11	Barcelona, G.	Nev..	5,000,000	200,000	25	*	...	...	...	
12	Bechtel Con., G.	Cal..	10,000,000	100,000	100	173,500	Jan.	1883	.10	
13	Belmont, S.	Nev..	5,000,000	50,000	100	735,000	Apl.	1886	.10	
14	Best & Belcher, G. S	Nev.	10,080,000	100,800	100	1,900,590	Aug.	1887	.50	
15	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*	...	...	...	
16	Bi-Metallic, S.	Mon	5,000,000	200,000	25	*	...	...	...	
17	Black Jack, G.	Cal..	250,000	100,000	2½	...	...	...	...	
18	Boston Con., G.	Cal..	10,000,000	100,000	100	170,000	Nov	1883	.25	
19	Bradshaw, S.	Ariz.	2,250,000	225,000	10	...	...	...	...	
20	Brunswick, G.	Cal..	2,000 000	400,000	5	*	...	...	...	
21	Bullion, G. S.	Nev .	10,000,000	100,000	100	5,050,000	Aug	1887	.50	
22	Bye and Bye	Ariz.	1,000,000	100,000	10	*	...	...	...	
23	Calaveras, G.	Cal..	500,000	500,000	1	*	...	...	...	
24	Carisa, G.	Wy	500,000	100,000	5	*	...	...	...	
25	Cashier, G S	Colo.	500,000	250,000	2	*	...	...	...	
26	Cen Contin't, G. S L.	C &A	2,000,000	200,000	10	*	...	...	...	
27	Charles Dickens, G. S.	Idan	1,250,000	250,000	5	*	...	...	...	
28	Cherokee, G.	Cal..	1,500,000	150,000	10	...	...	...	...	
29	Chollar, S.	Nev..	11,200,000	112,000	100	1,152,000	Aug	1887	.50	
30	C nnamon Mt., G. S	Colo	750,000	150,000	5	...	...	...	...	
31	Climax, S. L.	Colo.	2,000,000	200,000	10	...	...	...	...	
32	Colorado No. 2, S. L	Colo.	100,000	10,000	10	*	...	...	...	
33	Comstock, G. S	Nev..	10,000,000	100,000	100	30,000	Mar	1887	.15	
34	Con. Imperial, G. S.	Nev..	5,000,000	50,000	100	1,175,000	Sept	1887	.25	
35	Con. Pacific, G.	Cal..	6,000 000	6 ,000	100	183,000	Sept	1887	15	
36	Cons Silver, S.	Mo..	2,500,000	250,000	10	...	...	...	...	
37	"Cop. Queen Cons, C.	Ariz	1,400 00	140,000	10	...	...	...	...	
38	Courtlandt	Colo	500,000	50,000	10	...	...	...	...	
39	Crescent, S. L.	Colo.	3,000,000	300,000	10	*	...	...	...	
40	Crocker, S.	Ariz	10,000,000	100,000	100	75,000	May	1887	.10	
41	Crowell, G.	N. C.	5 0,000	5,000	1	...	...	...	...	
42	Dahlonega, G.	Ga..	250,000	250,000	1	*	...	...	...	
43	Dandy, S.	Colo.	5,000,000	500,000	10	...	...	...	...	
44	Dardanelles, G.	Cal..	1,000,000	100,000	10	...	...	...	...	
45	Decatur, S.	Colo.	1,500,000	300,000	5	*	...	...	...	
46	Denver City, S. L.	Colo.	5,000,000	500,000	10	*	...	...	...	
47	Denver Gold.	Colo	300,000	60,000	5	...	...	...	...	
48	Deseret, G S.	Utah	500,000	50,000	10	*	...	...	...	
49	Dunderberg, S.	Colo	1,500,000	150,000	10	*	...	...	...	
50	Durango, G.	Colo	500,000	500,000	1	*	...	...	...	
51	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	900,000	Mar.	1886	1.00	
52	El Cristo, G. S.	U.S.C	1,000,000	500,000	2	*	...	...	...	
53	El Dorado, G	Cal.	1,0 0,000	2 0,000	4	...	...	...	...	
54	Empire, S.	Utah	10,000,000	100,000	100	...	...	...	...	
55	Enterprise, S. L.	Colo.	800,000	80,000	10	*	...	...	...	
56	Eureka Tunnel, S. L	Nev..	10,000,000	10,000	100	*	...	...	...	
57	Exchequer	Nev .	10,000,00	100,000	100	880,000	July	1887	.20	
58	Found Treasure, S.	Nev..	10,000,000	100,000	100	...	...	...	...	
59	Gold Cup, S	Colo.	5 0,000	500,000	1	*	...	...	...	
60	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec.	1888	.25	
61	Gold Rock, G.	Cal.	1,000,000	500,000	2	*	...	...	...	
62	Goodsnaw, G.	Cal..	10,000,000	100,000	100	*	...	...	...	
63	Grand Belt, C	...	12,000,000	120,000	100	*	...	...	...	
64	Grand Duke	Colo.	800,000	80,000	10	...	...	...	...	
65	Great Romance, G.	U.S.C	1,0 0,000	50,000	2	*	...	...	...	
66	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*	...	...	...	
67	Gregory Con., G	Mon.	3,000,000	300,000	10	...	...	...	...	
68	Harlem M. & M. Co. G.	Cal.	1,000,00	200,000	5	...	...	...	...	
69	Head Cent. & Fr. S. G	Ariz.	10,000,00	100,000	100	...	...	...	...	
70	Hector, G.	Cal..	1,500,000	300,000	5	...	...	...	...	
71	Highland, C	Mich	500,000	25,000	25	...	...	...	...	
72	Hortense, S.	Colo.	2,000,00	20 ,000	10	*	...	Oct.	1881	.15
73	Huron, C	Mich	1,0 0,000	40,000	25	280,000	May	1887	3 00	
74	Iron Gold & Silver, S	N. M.	2,000,000	200,000	10	...	...	...	...	
75	Iroquois, C	Mich	1,250,000	50, 00	25	...	...	...	...	
76	J. D. Reymert	Ariz	10,000,000	100,000	100	*	...	...	...	
77	Julia Cons., G. S.	Nev..	11,000,00	110,000	100	1,452,000	Apl.	1887	.10	
78	Kearsarge, C.	Mich	1 250,000	50,000	25	100,000	Apl.	1886	5.00	
79	Laclede	N. M.	2,000,00.	200,000	10	...	...	...	...	
80	Lacrosse, G.	Colo.	1 00,000	100,000	10	*	...	...	...	
81	Lee Basin, S. L.	Colo.	5 0,000	500,000	10	*	...	Jan.	1885	.10
82	Lucerne, S.	Colo.	5,000,000	500,000	10	*	...	Dec.	1881	...
83	Mammoth Bar, G.	Cal..	10,000,000	100,000	100	50,000	Feb.	1883	.25	
84	Mariposa pref., G.	Cal..	5,000,000	50,000	100	1,687,500	Dec.	1883	.20	
85	" common, G	Cal..	10,000,000	100,000	100	1,975,000	Mar.	1884	.15	
86	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Sept	1887	.25	
87	Mayflower Gravel.	Cal..	1,0 0,000	100,000	10	235,000	Apl.	1888	3.00	
88	Medora

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	Oct. 8. H.	Oct. 8. L.	Oct. 10. H.	Oct. 10. L.	Oct. 11. H.	Oct. 11. L.	Oct. 12. H.	Oct. 12. L.	Oct. 13 H.	Oct. 13 L.	Oct. 14. H.	Oct. 14. L.	Sales.
Alice, Mon	....	.....	.....	.....	....	....	....	....	....	.....	....	.....	.....
Argenta, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bassick, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belcher, Nev	6.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Belle Isle, Nev	....	.....	.....	.....	.75	.70	...	....	.80	.....	.....	.....	400
Bodie Cons., Cal	....	.....	.....	.....	1.85	....	...	....	.43	.40	1.70	.....	500
Breece, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	400
Bulwer, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Caledonia, Dak	....	.....	.....	.....	1.50	1.35	1.50	1.45	.....	.....	.....	.....	280
Choliar, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Cent'l, Colo	....	.....	.....	.....	2 20	....	.....	.....	2 30	....	2 25	....	300
Cons. Cal. & Va., Nev	....	.....	.....	.....	17.75	....	16.25	.....	16.00	.....	.....	.....	225
Crown Point, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.37	.....	100
Deadwood, Dak	3.00	.....	.....	.....	.....	.....	.....	.....	2.75	.....	2.90	2.85	1.300
Dunkin, Colo	....	.....	.....	.....	.....	.....	1.00	....	.....	.....	.....	.....	1,000
Eureka Cons., Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Father de Smet, Dak	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Freeland, Colo	....	.....	.....	.....	.....	.....	.....	.....	.50	.....	.....	.....	100
Gold Stripe, Cal	....	.....	.....	.....	.....	.....	.....	.....	.26	.....	.....	.....	26
Gould & Curry, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Mountain, Cal	.11	.09	.10	.06	5.13	....	.....	.....	.09	.....	.09	.....	100
Hale & Norcross, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 00	....	2,000
Helena, Mont	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 00	....	100
Holyoke, Idaho	.08	.....	.10	.09	.10	.....	.10	....	.10	.....	.....	....	300
Homestake, Dak	....	.....	.....	.....	.....	.....	.....	.....	14.00	.....	14.25	....	5,800
Horn-Silver, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.90	.85	....	....	128
Independence, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	700
Iron Hill, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.90	.....	130
Leadville C., Colo	...	.....	.....	.....	.....	.....	.40	....	.40	....	.....	....	300
Little Chief, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Pittsburg, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Martin White, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, Cal	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.75	1.65	600
Moulton, Mont	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Navajo, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Belle Isle, Nev	....	.....	.....	.....	8.75	....	.....	.....	.....	.....	.....	.....	100
Ontario, Ut	.....	.....	.....	.....	27.00	.....	26.25	.....	27 25	26.00	27,25	.....	185
Ophir, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plymouth, Cal	20.13	.....	20.13	20.00	.....	.....	.....	.....	19.25	.....	.....	.....	400
Quicksilver Pref., Cal	.....	.....	.....	.....	.....	.....	.....	.....	23.00	.....	.....	.....	100
" Com., Cal	.....	.....	5.25	.....	.....	.....	4.50	....	.....	.....	5.00	...	350
Robinson Cons., Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Savage, Nev	....	.....	.....	.....	.....	.....	.....	.....	8.00	.....	.....	.....	100
Sierra Nevada, Nev	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.75	....	100
Standard, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stormont, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Surinam, D. G	3.55	.....	.....	.....	.....	.....	3.50	.....	3 55	.....	3.55	...	4,000
Yellow Jacket, Nev	.....	.....	.....	.....	6.13	.....	.....	.....	.....	.....	.....	.....	100

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	Oct. 8. H.	Oct. 8. L.	Oct. 10. H.	Oct. 10. L.	Oct. 11. H.	Oct. 11. L.	Oct. 12. H.	Oct. 12. L.	Oct. 13. H.	Oct. 13. L.	Oct. 14. H.	Oct. 14. L.	Sales.
Alta, Nev	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Amador, Cal	1.35	1.30	1 35	.....	1.35	1.30	1.30	.....	1.30	.....	1.30	1.25	2.150
Am. Flag, Colo	....	.....	.....	.....	.....	.....	.06	.....	.06	.05	.06	....	1,900
Barcelona, Nev	.....	.....	.53	.....	.....	.....	.....	.....	.....	.....	.....	.....	500
Bechtel Con., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & B'licher, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.25	.....	200
Big Pittsb'g, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brunswick	1.60	1.55	1.65	1.55	1.60	1.30	1.60	.....	1.60	1.55	1.60	1.55	7,800
Bullion, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cashier	.....	.....	.....	.....	.50	....	.50	.....	.....	.....	.45	.....	300
Castle Creek, Id	.....	.....	.11	.10	.11	.10	.11	.10	.10	.....	.....	.....	4,100
Central Ariz., Ariz	....	.....	.....	.....	.....	.....	.09	.08	....	.....	.....	.....	1,700
Columbia & Beaver	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Imperial	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.15	.....	400
Decatur, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastern Oregon	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
El Cristo, U. S. Col	2.50	....	2.45	2.35	2.35	.....	2.30	2.00	2.25	1.95	2.00	....	2,800
Found Treasure	..	...	.....	.....	.....	.....	.....	.....	.....	....	2.10	.....	100
Hector	....	....	.....	.....	.....	.....	.....	.....	.45	....	.....	.....	100
Julia, Nev	.....	.....	.50	...	.....	.....	.55	.....	.....	.....	.....	.....	300
Justice, Nev	....	...	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lacrosse, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.10	.. ..	500
Mexican, Nev	....	....	4.10	....	.....	.....	.....	.....	.....	.....	.....	.....	100
Middle Bar, Cal	.40	....	41	.40	.40	...	.40	.39	.40	...	.39	.38	9,100
Monitor	....	.....	18	....	.19	.18	.20	.17	.19	.17	....	....	15,500
New Pittsb'g, Colo	....	.....	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Stand'd, Cal	....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Horn-Silv'r, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oneida Chief	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l&Mil'r, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phœnix of Arkan's	1.60	....	1.70	....	1 65	....	1.65	....	1.65	1.60	1.70	1.65	1,500
Phœnix of Arizona	1.25	1.00	1 40	1.00	1.00	....	1.10	1.00	1.05	1.00	1.00	.....	7,400
Potosi	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahann'k, Va	.18	....	.....	.....	.18	..	.18	....	.17	.....	.17	.....	4,900
Red Elephant, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Renfrew, N. S	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Saint Kevin, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Sebastian	...	.....	..	...	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santiago, U. S. Col	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Security, Colo	1.00	....	1.13	1.00	1.50	.95	1.05	.....	1.50	1.12	1.75	1.20	3,800
Silver Cliff, Colo	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Leaf	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Queen, Ariz	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stanislaus, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State L'e, 1&4, Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Nos. 2 & 3, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel, Nev	.35	.31	.36	.33	.35	.34	.36	.33	.35	.34	.35	.34	32,000
Taylor Plumas, Cal	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tioga	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tornado	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Cons., Nev	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Dealt in at the New York Stock Exchange. Unlisted Securities

BOSTON MINING STOCK QUOTATIONS.

Name of Company.	Oct. 7.	Oct. 8.	Oct. 10.	Oct. 11.	Oct. 12.	Oct 13.	Sales.
Atlantic, Mich	.....	.....	.....	9.00 8.75	.....	.....	50
Bodie, Cal	.....	.....	.....	.....	.....	.....	.....
Bonanza D	1.00	.....	.....	1.00	1.00	.95	510
Boston & Mont., Mont	.....	.....	.....	.....	.....	.....	.....
Breece, Colo	.33	.....	37½ ..	.....	.....	.....	300
Calumet & Hecla, Mich	200	.....	.....	198	198	197 196	195	121
Catalpa, Colo	.26	.20	.26	.26 .20	.26	..... .26	.....	1,440
Central, Mich	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....
Con. Virginia, Nev	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Colo	1.00	.90	1.00	87½ 97½	.....	1.02 97⅛	.94	.99	3,975
Enterprise	.....	.....	.....	.....	.....	.....	.....	.....
Eureka, Nev	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, Mich	.....	.....	10.00	.....	.....	10.50	.....	10¼ 10.00	270
Freeland, Colo	...	.....	.....	.....	.....	.....	.....	.....
Holyoke	10	.....	.....	.....	.....	.....	.....	.....	200
Honorine, Utah	.....	.....	.....	.....	.....	.....	.....	.....
Ironton Iron Co., Mich	.....	.....	.....	.....	.....	.....	.....	.....
Napa, Cal	1.25	1⅛	.....	1⅛	.....	.....	1⅛	600
Osceola, Mich	24.00	.....	24.00	23.00	.....	23.00	.....	23.00	27.00 24.00	803
Pewabic, Mich	.....	.....	.....	.....	.....	.....	.....	.....
Quincy, Mich	.....	.....	.....	.....	50½ 50.00	.....	50.00	.....	14
Robinson, Colo	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz	.....	.....	.....	.....	.....	.....	.....	.....
Standard, Cal	.....	.....	.....	.....	.....	.....	.....	.....
Stormont, Utah	.06	.....	.....	.....	.....	.08	.08	.08	1,500
Surinam, D. G	.....	.....	.....	.....	.....	.....	.....	.....

Name of Company.	Oct. 7.	Oct. 8.	Oct 10.	Oct. 11.	Oct. 12.	Oct. 13.	Sales.
Abington	.....	.....	.....	.....	.....	.....	.....
Allouez, Mich	.60	.....	.50	.60	.60	.60	.50	1,200
Arnold, Mich	.....	.....	.....	.....	.....	.....	.....	.....
Aztec	.....	.....	.07	.....	.....	.....	.07	300
Blue Ridge, Mich	.....	.....	.....	.....	.....	.....	.....	.....
Bijou	.....	.....	.....	.....	.....	.....	.....	.....
Bowman Silv'r, Nev	.04	.....	.....	04	.....	.....	.....	500
Brunswi'k	.....	.....	1.60 1.55	.....	1.55	.....	1.60 1 55	1,400
Cashier, Colo	.....	.....	.....	.....	.....	.....	.....	.....
Contentment	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific, Cal	.....	.....	.....	.....	.....	.....	.....	.....
Crescent, Colo	10	.....	10	.....	.10	.10	.10	2,400
Cusi, N. Mex	27	.25	.26	.25	.25	.....	.....	1,800
Decatur, Colo	.....	.....	.....	.....	.....	.....	.....	.....
El Cristo	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.....	.....	.....	.....	.....	.....	.....	.....
Huron, Mich	.....	.....	.....	.....	.....	.....	.....	.....
Mono, Cal	.....	.....	.....	.....	.....	.....	.....	.....
National, Mich	.....	.....	.....	.....	.....	.....	.....	.....
Oriental & M., Nev	.....	.....	.....	.....	.....	.....	.....	.....
Phœnix, Ariz	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va	.18	.....	.....	.....	.17	.....	.....	900
Security, Colo	1.00	.....	.....	1.00	.....	1.10	.....	500
South Side	.15	.....	.....	.....	.....	.....	.....	100
Sutro Tunnel, Nev	.35	.....	.....	.35	.36	.34	.35	2,100
Tamarack	100	99.50	.....	.....	.....	.....	.....	.....	50
Taylor Plumas, Cal	.....	.....	.....	.....	.....	.....	.....	.....

New York: Dividend shares sold, 16,694. Non-dividend shares sold, 65,150. Total New York, 81,844.
Boston: Dividend shares sold, 9,783. Non-dividend shares sold, 11,150. Total Boston, 20,933.

COAL STOCKS.

Name of Company.	Par value of shares.	Oct. 8. H.	Oct. 8. L.	Oct. 10. H.	Oct. 10. L.	Oct. 11. H.	Oct. 11. L.	Oct. 12. H.	Oct. 12. L.	Oct. 13. H.	Oct. 13. L.	Oct. 14. H.	Oct. 14. L.	Sales.
Barclay Coal	...	.....	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & O. RR	100	5⅛	.....	5½	.....	5	...	5	....	5	.....	.....	.....	705
*Chic. & Ind. Coal RR	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	100	.....	.....	22	.....	27½	.....	.....	.....	.....	.....	.....	.....	225
Col., C. & I	100	35	34¼	34¼	31½	33	31	31¼	32½	33½	32	33¾	31½	7,925
Consol. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	.....	100
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	99	98¼	98½	97¾	98¼	97⅝	98¾	97	98½	66¾	98¼	.....	5,603
D., L. & W. RR	50	126	125¼	126	124⅜	126⅝	125	126⅛	124¼	125⅝	123⅞	125⅛	123⅛	141,690
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hocking Valley	100	21⅝	.....	23¾	22	22½	22	22½	21¾	22	21¾	22⅛	21½	6,155
Lehigh C. & N.†	50	47½	.....	47⅛	46¾	47	47	46½	.....	46¾	.....	.....	.....	1,248
Lehigh Valley RR.†	50	55½	55¼	55⅝	55¼	55	.....	55	.....	54⅝	54½	.....	.....	477
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal	100	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	.....	.....	13¼	13	.....	.....	.....	.....	.....	.....	.....	.....	300
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	.....	.....	.....	.....	.....	.....	.....	.....	137	.....	.....	.....	50
New Central Coal	100	.....	.....	12½	.....	.....	.....	12½	12	.....	.....	.....	.....	300
N. J. C. RR	100	72¼	71⅛	72	71¼	73½	71¾	74¼	71¾	73⅝	71⅛	73	71⅞	25,705
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	.....	.....	9¼	9	9¼	9	9	.....	9	.....	9¼	.....	734
Do. pref	100	28¼	.. ..	27¾	26¾	27½	27	27	. ..	27	26	.....	.....	1,408
N. Y. & Perry C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western RR	100	13½	...	14	13¼	14	13¾	14⅛	.....	14	13½	14¼	.....	884
Do. pref	100	40	39¾	40⅛	38¼	38⅛	37¼	38⅝	37½	38¾	35¾	37	35	11,236
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.†	50	55⅛	55¼	55¼	54⅛	55	54⅛	55	54⅛	54¼	53¼	.....	.....	9,026
Ph. & R. RR.**	50	60⅝	60	61⅛	59¾	62⅛	59¾	62	59⅝	62	59½	61¾	60	799,941
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	100	26	24½	24¾	24	24	23¼	23⅝	23½	24	23½	24¾	23	3,150
Westmoreland Coal†	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

** Of the sales of this stock, 117,251 were in Philadelphia, and 682,690 in New York.
† The quotations for these stocks are not percentage, but actual price.
Dealt in at the New York Stock Exchange, Unlisted Securities.

Total sales, 1,016,862.

San Francisco Mining Stock Quotations.

Company.	Closing Quotations. Oct. 7.	Oct. 8.	Oct. 10.	Oct. 11.	Oct. 12.	Oct. 13.	Oct. 14.*
Alpha	.....	.....	.....	.....	.....	.....	.....
Alta	2¼	2¼	2¼	2⅜	2½	2¼	.....
Argenta	.....	.....	.....	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.70	.70	.75
Best & Bel	6⅛	6¼	6¼	7	7	6¼	6¾
Bodie	1¾	.....	1¾	.....	1⅜	1¾	1.90
Bulwer	.80	.80	.....	.85	.80	.85	.85
Chollar	5	5	4¾	5⅛	5¼	4⅞	4.95
Com'nwith	.....	.....	.....	.....	2¾	2¾	.....
Con. C. & V.	15⅛	16½	16	16⅜	16½	16⅜	16⅛
Con. Pac.	.....	.....	.....	.....	.....	.....	.....
Crown Pt.	6¾	6⅛	7	8	9¼	9	.....
Eureka C.	7¼	7⅛	.....	7⅛	7	7	.....
Gould & C.	4½	4⅝	4⅝	5	5	4⅞	4.80
Hale & N.	4	4	3¾	4	4⅛	4	4
M. White	.....	.....	.....	.....	.....	.....	.....
Mexican	4⅛	4¼	4⅛	4¼	4⅜	4¼	4 1-5
Mono	1¾	1¾	1¼	1¼	1⅜	1¾	1.30
Mt. Diablo	.....	.....	.....	.....	4¼	.....	.....
Navajo	1⅛	.....	1¼	1¼	1⅛	1⅛	.....
Nev. Queen	.....	.....	.....	.....	4⅝	4¾	.....
N. Belle I.	.....	.....	.....	.....	9¼	9⅞	10
Ophir	7⅜	7½	7⅞	7¾	7¾	7⅝	7¼
Potosi	5⅛	5¼	5	5⅛	5⅝	5¼	.....
Savage	7	7¼	7⅞	7¾	8⅛	8	7⅞
Scorpion	.....	.....	.....	.....	.....	.....	.....
Sierra Nev.	4¼	4¼	4⅛	4⅛	4¼	4¼	4.35
Sutro Tun.	.....	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....	.....
Union Con.	3⅛	3¼	3⅜	3⅜	3⅜	3¼	3.45
Utah	1¾	1¾	1¾	1¾	1¾	1¾	.....
Yellow Jkt.	5⅛	5¼	5⅜	5⅛	5¾	5⅜	5½

* Opening quotations.

soon as possible. There are some other furnaces that will likely be blown out, but not because of an inability to find a market for their product. There is nothing in the situation to justify the supposition that an over production is threatened; at the same time, buyers are not coming forward as promptly as the makers would like. In isolated cases sales have been made at fifty cents per ton lower than a week or ten days ago. It is, of course, possible, in fact, probable, that this lower range of prices will be established before the end of the month. The furnace companies are looking forward to a steady demand throughout the winter, and do not see why a drop of even fifty cents should be forced upon them, but at the same time are in a yielding frame of mind. There is an appearance of weakness in eight or ten of the inferior brands. In the choice brands, makers are holding firmly. In the standard brands, large orders could be had at a little concession. The appended quotations cover the extreme range of prices. Muck Bars are quoted at $30.50@$31.50, and less business than usual has been done this week. In foreign materials there is scarcely anything doing. Quotations are more or less nominal. If buyers come forward they will be furnished with special cable quotations if desired. The latest private advices are to the effect that prices abroad are firmer than the "offish" condition of the American market allows. Heavy consumers a week or two ago were disposed to place orders, but have not yet done so, and will now probably await further developments. Charcoal blooms are in fair request at $53. Merchant bar is less active, although no complaint should be made, as the mills are nearly all well supplied, and good consumption is assuring a steady demand for the future. There has been quite an active demand for skelp iron, but nothing, so far as known, has yet sold above 2c., though quotations have been given at 2·10c. The nail makers meet to day in New York, and will probably remove some of the difficulties in the way of more active demand. Wrought-iron pipes are quite active. The mills are full of work, and the sheet-iron demand is about as it has been; one or two heavy orders have been booked this week. The merchant steel makers report a quiet, steady demand at full prices. Structural iron is without change in demand or prices; both plate and tank are in good request. Steel rails are quoted as low as $34, and it is intimated that $33 will buy them, though rail makers themselves positively decline to be quoted one way or the other as to current rumors; this week's meeting in New York will throw a great deal of light upon the situation. Quite a demand has sprung up for small lots of old rails, and a good many orders were made to-day. Quotations, $22.50. The scrap yards are doing very little; any one having selected lots to sell will find ready buyers at full prices.

FINANCIAL.

NEW YORK, Friday Evening, Oct. 14.

The Condition of Trade.

Reports from various regions of the country this week make it plain that the rush of the Fall trade is over. The decline in the movement of dry goods is most marked, but the shipment of grain to interior markets is also beginning to fall away, after the rush of a few weeks ago, particularly at the Northwest. At Duluth alone, the receipts of grain thus far this season are several million bushels less than last year to the corresponding date. It appears to be true that the distribution of general merchandise in the response to the Autumn demand has been checked this year somewhat earlier than usual, and that at some points the volume of goods disposed of has been somewhat disappointing.

The iron trade in general has been quite unsatisfactory within late weeks. Notwithstanding the production of the enormous quantity of over 144,000 tons weekly throughout the country, and the reported unwillingness of stocks to accumulate (thus pointing to a very heavy general demand), prices refuse to advance at all; and this at a season of the year when consumption is generally expected to be most active, and when the trend of prices is upward. Many conservative members of the trade insist that there must, that there will be, an advance in prices of pig-iron, but they stoutly decline to intimate the particular cause of their confidence or to speculate publicly concerning the probable date of announcement of higher prices. There is evidently less confidence in steel rails, for reports are current of a number of orders that "have been placed abroad," with a reduction in price to $34 per ton for 1888 deliveries, backed by a reluctance on the part of railway companies to order with that freedom in advance of near requirements which had been looked for with great confidence a few months ago. Scotch pig receipts continue to average about 1500 tons weekly, with the market quiet and prices off 22@50c. per ton within a fortnight, owing, as stated, to the reduction of freight rates.

Anthracite coal is in brisk demand east and west, and leading Wyoming and Schuylkill region shipping companies are rushed to meet contracts. The Reading Coal Company has contracted for all the coal it can take out during October, and is not receiving new orders for this month. The Lehigh Coal and Navigation Company refuses to advance the wages of its striking employés, alleging that the sliding scale already in existence should meet all reasonable demands, providing as it does for higher wages with advances of the price of coal. The outlook seems to favor a relatively early resumption of work in the Lehigh region, for, in addition to the fact that a few of the smaller (individual) miners have opened their mines and have secured miners, it is reported that Pardee and Coxe Bros. & Co. have likewise opened some of their shafts and that a few miners are already at work there. Just what may be the outcome of the situation should the mine-owners in the Lehigh succeed in sending their employés back to work at the old scale of wages, after the Reading and other companies have granted an 8 per cent advance, is not easy to foresee. That the situation would breed discontent among the employers and result in an abrogation of the 8 per cent advance in the Schuylkill seems more than probable.

In the financial world the situation is easier. Rates for money on call at New York have ranged from 3½ to 5 per cent, and prime commercial paper discounts are made with appreciably more freedom at from 6 to 8 per cent. While the New York banks lost some reserves last week, there is a prospect of an early return flow of funds from the interior, which is reflected in a disposition on the part of bankers to loan more freely. London exchange ranges from $4.85@$4.85¼.

The Coal Road Stocks.

The sensation of the week in Wall street is one long since anticipated, the acquisition by the Western Union Telegraph Company of the Baltimore & Ohio telegraph. This had the effect of temporarily advancing the price of Western Union and has brought out reports that Mr. Gould is to shortly take an active interest in the market as a bull. The passing of its dividend by the Baltimore & Ohio Railroad Company was used as a bear argument and the market went off again. Reading shares have been very irregular, the price being made to hinge daily upon rumors favoring and again denying the securing of the assent of the majority of holders of Reading first series fives to the plan of reorganization. Meanwhile the Corbin party have swung the club of the foreclosure suit to bring outsiders to terms. Recent reports of greatly increased earnings of the Philadelphia & Reading Railway have been subjected to the most violent criticism by those who are not in sympathy with "the party which is tryiug to bull Reading." A Philadelphia paper publishes the following figures, showing the assets of the company, which were prepared for Mr. Corbin, and which have been handed about among friends. They sufficiently indicate the bullish tendencies of the street leaders in Reading:

Balance in hands of Reconstruction Trustees		$2,518,982.83
Market value of securities belonging to the Reading Railroad Company, now pledged with floating debt. This does not include the Reading's own issues		9,467,000.00
Current assets of the two companies in excess of their current liabilities, excluding $1,414,388.85 mat-rials on hand		1,405,037.52
Unincumbered assets, available for the purpose of avoiding foreclosure		13,391,020 35
Cash in company's treasury		2,300,000.00
		$15,691,020.00
Material		1,414,388 00
		$17,105,408 00

"If the items are correct the total amount of assets is nearly 50 per cent of the outstanding stock. The statement concludes with this remark: 'This must eventually tell, and within twenty days we shall see Reading selling at 65@70. It is a conservative prophecy that Reading will sell at 65 within twenty days.'"

Prices of leading coal road shares have been quoted at the close (bid) as follows:

	Oct. 7.	Oct. 12.	Oct. 14*.
Buff R & Pit	40	40	64
Col. Coal & Iron	36	31	32
Col. H. V. C. & I.	24	22	..
Del. & Hudson	98¼	97⅛	97
Del., Lack. & W.	125¾	124½	123¼
N. J. Central	72	73	72
Phila. & Reading	60⅝	59¼	60⅜

* Closing quotations.

Mining Stocks.

The week has been one of the most uninteresting of the year. Transactions are few, inquiries have been small, and there are no indications of an early revival. It now looks as if the year would close without a repetition of the boom which struck the East last fall. Numerous new shares which were admitted in the Consolidated Stock and Petroleum Exchange, some time back, have not yet been called, owing to the stagnation in speculation. Owners of mining properties consider this an unfavorable time for introducing their shares to the public, and are wisely holding back. Besides this there are several companies who have not yet even applied to list their shares. Pilgrim will soon come up for consideration and will undoubtedly be admitted. Tertalita shows no signs of making its first bow to the public through the Exchange, and, considering the recent exposure of its hollowness and the present depression in stocks, there is little chance of its risking a "quotation."

Moreno Valley, Oneida Chief, Zelaya, Princeton, Gold Rock, and Great Remance are among the new stocks to be dealt in later, or when the atmosphere presents a more inviting condition.

Homestake shows a small business at from $14@$14.25. Deadwood Terra shows a declining tendency, notwithstanding the dividend of $20 000 just declared by the company. The price went from $3.00@$2.75, selling to-day at from $2.85@$2.90. Caledonia advanced from $1.35@$1.50. Father de Smet shows a sale of 100 shares at 50 cents per share.

El Cristo is very quiet and attracts very little comment, the general verdict being that the condition of the company is rotten throughout and that holders who paid a high price for the stock will have little or no chance of recouping themselves. The price declined this week from $2.50@$1.95, selling to-day at $2.

The Talento mine has passed under new and highly respectable management here. We understand Mr. E. E. Olcott, mining engineer, is to have the supervision of the mine management. This will be entirely satisfactory to every holder of the stock.

Considerable interest has been displayed in Brunswick, which shows sales of 7800 shares at from $1.55 to $1.60. Good reports continue to be received from this property. Plymouth Consolidated has declared its usual monthly dividend of $40,000. The price has been lower, going from $20.13 to $19.25. Quicksilver Preferred is firm at $23, and Common has been lower at from $5.25 to $4.50, selling to-day at $5. Amador and Middle Bar still receive attention, the former selling at from $1.25 to $1.35, and the latter from 38 to 41c. Bodie Consolidated is quiet and rules at from $1.85 to $1.70, and Mono at from $1.65 to $1.75. Green Mountain declined from 11 to 6c., but to-day crept up again to 9c. It is stated that the stockholders of Taylor-Plumas have agreed upon a truce whereby the assessment difficulty will be overcome.

The Surinam Gold Mining Company continues to declare dividends much too fast, as we think for a gravel claim working only since August, or two and a half months. We deem it but right to say that rumors have reached us which appear to us to justify a warning to proposing investors to examine closely the information furnished concerning this property before parting with their money. In an early issue we hope to be able to furnish fuller information concerning this property from distinguished and well informed sources. The stock has been quiet, selling at from $3.50@$3.55.

We have received the following letter in reference to the annual meeting of the Horn-Silver Mining Company:

NEW YORK, Oct. 14, 1887.

TO THE EDITOR OF THE ENGINEERING AND MINING JOURNAL:

SIR: The following extract from a letter from Mr. Simonds contains all the additional information about the Horn-Silver election which is in my possession.

Yours truly, B. MC. E. WHITLOCK

SALT LAKE CITY, Oct. 5, 1887.

* * * We arrived at Salt Lake on Friday evening last, and spent Saturday and Sunday and Monday morning there and left for Frisco Monday afternoon, arriving there next morning at 8:45. We found Francklyn and Brown waiting there. At Salt Lake we had much talk with the parties holding stock and secured some 13,000 shares, all there was, except 8000 held by Bishop Sharp, who is a shining light among the Mormons. He was non-committal and would not say how he would vote. * * * I found three of your letters at Frisco containing proxies as noted. After the meeting came to order, it was decided that the list of stockholders should be called through, and each name represented at the meeting should be answered for and the number of shares owned be announced. In this way we could tell how the parties stood, before the formal vote was taken. By the time we had got through the third column on our printed list, I thought we would be beaten by 40,000 shares, but afterward we pulled up and at the close it was awfully close. The total vote as announced by the tellers was 309,917, and Francklyn's votes, as checked off by me were about 154,000. We were about 147,000. Washington's proxies fell off over 10,000, either from transfers of stock or changes to the other side. Mine went off 1100. This left the matter entirely in the hands of the bishop, who was represented by one of his numerous sons. We all had a hurried consultation, and each side tried to win the bishop's son. He finally told Francklyn that if he would consent to a compromise he would vote for it, and that if he would not, he would vote for us. He told us that if we would not agree to compromise he would vote the other side, and that if neither party would agree, that he would not vote at all. Francklyn was terribly put out and very unwilling to compromise, but there was nothing for him to do but give in. We elected on our side Washington, yourself, and Jas. T. Little, who is cashier in the Deseret National Bank in Salt Lake, and an A1 man. They elected Francklyn, Brown, Theodore C. Camp, and Hill, the manager of the mine. * * *

The Salt Lake *Tribune* is very uncomplimentary to Mr. Washington, but we trust that we shall shortly receive a full statement of the condition of the company, and that the parties who have stolen, or borrowed, as the case may be, the company's money will be made to refund it.

We shall follow these developements with interest, and shall do what we can to bring the true state of affairs before the public. The stock receives but little attention, and sold this week at from 85 to 90c. Ontario has shown considerable activity, selling at prices ranging from $26 to $27.25.

Cashier has not yet recovered, and shows only sales of 300 shares, at prices ruling from 50 to 45. Security is still kept alive by its manipulators, who have kept the price of the stock dancing about at from $1 to $1.70. We learn that the mill has closed down owing to a want of ore.

Dunkin is being strongly held, and finds more purchasers each day. There is some talk of an extra dividend at an early date. Sales were made at $1.

Breece is quoted at from 40@43c. Colorado Central shows more activity, and sold at from $2.20@$2.30. Freeland shows a sale at 26c., Iron Silver one at $2.90. Leadville a few at 40c. Monitor has at last reached 20c., and was one of the most active stocks on the list, showing transactions amounting to 15,500 shares.

Rappahannock continues to be dormant, and rules t from 17c, to 18c.